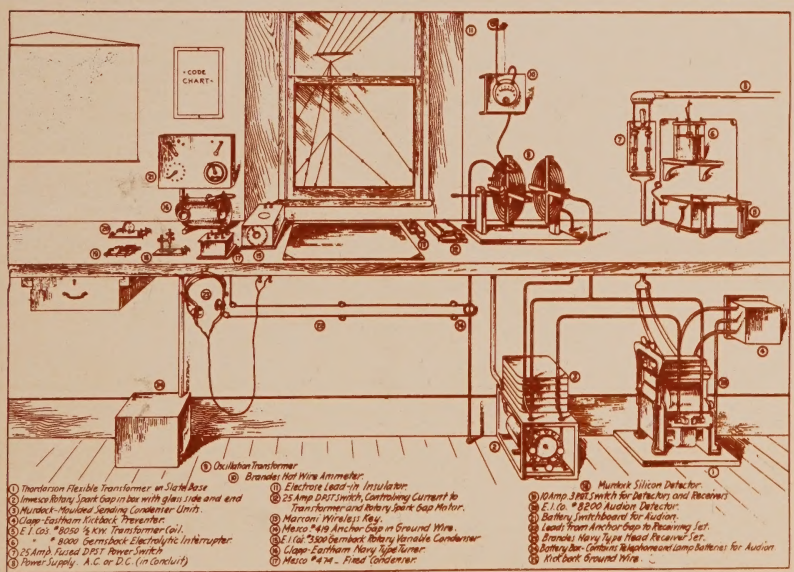
$4.95

The Magic of Ham Radio

by Jerrold Swank/W8HXR


CODE CHART
① Thordarson Flexible Transformer on Slate Base
② Inmesco Rotary Spark Gap in box with glass side and end
③ Murdock-Moulded Sending Condenser Unit.
④ Clapp-Eastham Kickback Preventer.
⑤ E.I.Co. #8058 ¼ KW. Transformer Coil.
⑥ " " #8000 Gernsback Electrolytic Interrupter.
⑦ 25 Amp. Fused DPST Power Switch
⑧ Power Supply. A.C. or D.C. (in Conduit)
⑨ Oscillation Transformer
⑩ Brandes Hot Wire Ammeter.
⑪ Electrose Lead-in Insulator.
⑫ 25 Amp DPST Switch, Controlling Current to Transformer and Rotary Spark Gap Motor.
⑬ Marconi Wireless Key.
⑭ Mesco #419 Anchor Gap in Ground Wire.
⑮ E.I.Co. #3500 Gernback Rotary Variable Condenser
⑯ Clapp-Eastham Navy Type Tuner.
⑰ Mesco #4 M.F. Fixed Condenser.
⑱ Murdock Silicon Detector.
⑲ 10 Amp. 3 Pole Switch for Detectors and Receivers
⑳ E.I.Co. #8200 Audion Detector.
㉑ Battery Switchboard for Audion.
㉒ Leads from Anchor Gap to Receiving Set.
㉓ Brandes Navy Type Head Receiver Set.
㉔ Battery Box-Contains Telephone and Lamp Batteries for Audion
㉕ Roof Bank Ground Wire.

A MODERN AMATEUR WIRELESS STATION

A 73 PUBLICATION

The Magic of Ham Radio

by

Jerrold Swank/W8HXR

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Foreword

Under various callsigns, Jerry Swank/W8HXR has been heard on the ham bands since 1919. He has watched amateur radio grow from the days of Model A spark coils to an era of microprocessors and satellite communications. In *The Magic of Ham Radio*, Jerry gives his account of our hobby during the past six decades.

W8HXR has often been where the action is. Jerry has responded to calls for help from earthquake-stricken Managua and tornado-ravaged Xenia. Antarctica, one of man's loneliest outposts, has been a bit less lonely, thanks to Jerry's tireless phone patching efforts. Drawing on his own colorful experiences and those of many other hams, Jerry has compiled this word-picture of what ham radio was and is.

The Magic of Ham Radio begins with a brief history of amateur radio and of Jerry's involvement in it. Part 2 details many of ham radio's heroic moments, when a ham's quick thinking and ability to communicate meant the difference between life and death. Hamdom's close ties with the continent of Antarctica are the subject of Part 3. In Part 4, the strange and humorous sides of ham life get their due. And what of the future? Part 5 peers into the crystal ball.

It has been said that any sufficiently advanced technology is indistinguishable from magic. Ham radio fits this description quite well. In what other activity is it possible to meet people, reunite them with loved ones, even save their lives without actually seeing those you've helped? Yes, there *is* something magical about ham radio, and we hams are the magicians.

Jeff DeTray
WB8BTH

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Looking Back: The History of Ham Radio

Ronald Reagan tells this story of an incident that occurred during a dinner he, as Governor of California, gave for the released Hanoi prisoners of war. During the evening two of the men accidentally met, and one heard the other's name. He whirled around and said, "Are you . . .?" "Yes, and are you . . . ?" They were suddenly speechless, and then threw their arms around one another. Though they had never seen each other, there were tears in their eyes as they silently embraced. For three long years, on opposite sides of a mud wall, they had communicated by tapping radio code signals on the wall of a North Vietnam prison. Each knew all about the other, but had never met face to face. This is the way with amateur radio — you may converse with a ham for years, never see him, yet become old friends.

My friend, Charlie Morgan, K1GZL, puts it this way, "It is wonderful to make friends throughout the world. International boundaries disappear, and the true brotherhood of man emerges bright and clear. The experimenting, giving a helping hand when emergencies and disasters strike, and wanting to know each other through our wonderful hobby really brings us close together no matter who or what we are."

After nearly sixty years in amateur radio, I cannot imagine a more fulfilling hobby. Here I am at home, sitting at my desk with my radio set, and I can be in Antarctica in a matter of minutes, talking to one of my many friends.

The lonely ham shack at McMurdo Station, Antarctica—KC4USV. Official U.S. Navy photo by Howard Weinger.

Servicemen all over the world depend on amateur radio for messages and telephone calls to their families and loved ones. But how did this all come about? When did it start? Who was the first amateur? What is an amateur?

Here is the dictionary definition to that last question: "Amateur — one who is attached to or cultivates a particular pursuit, study or science, as music or painting, from taste, without pursuing it professionally." The word amateur is derived from *amare*, to love — to love the work and the thrill of achievement.

In 1936 Clinton B. DeSoto wrote the following, which expresses as well as possible what the hobby was like then.

"The typical radio amateur of 1936 is a young man 25 years of age. He holds a license issued by the Federal Communications Commission qualifying him as an amateur radio operator, Class B, and as the licensee of an amateur radio station, all valid for a term of three years.

"His station, which is homemade from manufactured parts purchased largely in the neighborhood parts store, uses radiotelegraphy exclusively, although he expects some day to

try radiotelephony. The average value of his station is about one hundred dollars.

"The power of the transmitter is moderate, amounting to about 100 watts input to a pair of Type 10 transmitting tubes in the output amplifier stage, which is excited by a crystal-controlled oscillator.

"The receiver uses three tubes and is of the regenerative type, with one stage of radio-frequency and one of audio-frequency amplification. His antenna system consists of a 130-foot wire with a two wire transmission line perhaps sixty feet long suspended well up in the clear outside his home.

"Such is the typical radio amateur of 1936. Individuals, of course, depart widely from this norm. In age they range from eight to eighty; in education from those who halted in the grammar grades to the erudite holders of doctorial degrees; in social status from convicts in federal prisons to scions of wealthy families and the son of an ex-president of the United States; in occupation from coal miners and bell hops to major executives in giant corporations.

"Nor are they all men. Hundreds of women operators, married and unmarried must be added to the list. These fall between the extremes of a nine-year-old little girl operator who can beat professionals at their own game and an aged mother who keeps in touch with her sons by means of radio-communication.

"The story of amateur radio is the story of an adventurous band of free spirits scattered over the entire globe in every continent and every country, who hold communication far up in the heavenly spaces, over the roaring ocean and untracked land. It is the story of men and boys, eminent scientists and young lads in school — and women and girls as well — who at the touch of a key or a soft spoken word into a microphone can leap around the world; who have wiped out for all time the age old barriers of race, language, and distance.

"Hamfesting they go — a band of good fellows, happy, convivial, carefree, playing the game for the very love of it, but underneath all that carrying on with the deep earnestness of those who have successfully pierced the veil of the unknown and garnered the secrets of science.

"Ragchewing; greeting each other with the careless, cordial effrontery of "Old man" and "73" and CUL . . . and

then turning to the saving of a hundred lives in a fever ravished Alaskan village or flashing the kindly words of the homeland press to a party of explorers at the bottom of the world.

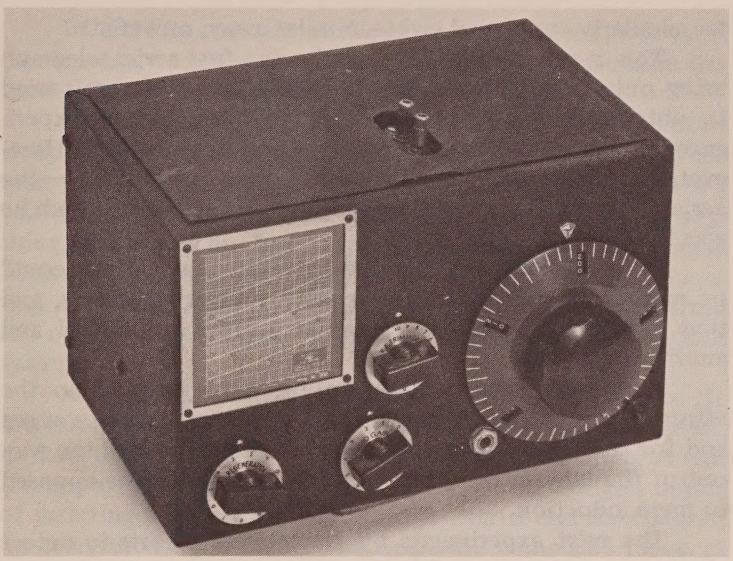
"There are amateurs in every field of endeavor. There are a thousand hobbies in which the spare time of humans is dissipated. But to none other than amateurs of radio is the existence in the world dominion of the air granted by an international treaty to which nearly all the nations of earth are signatory; for none other than amateur radio have these government written laws and formulated regulations and issued certificates of proficiency which make them the only class on earth capable of communicating beyond the range of their own senses without paying toll to some governmental agency or commercial corporation.

"In the great story of technical advance they have written another, of unparallelled service to humanity. Their great system of emergency communication carries on when all others have failed. From the very first days they have been on the vanguard. The predominant characteristic of the amateur is his altruism. Those not familiar with amateur practices find it hard to believe that altruism of such a high order exists anywhere in the world. The amateur wants every other amateur and the public to share in, and benefit by, his discoveries. The only thing he guards jealously and resentfully is his spot on the air — his place in the sun.

"The rivalry to accomplish something that has never been done before is intense, but it is rivalry of the friendliest sort, and no sooner does one make a new record than he wants to show all his fellow amateurs not only how it was done, but how they also can do it. If an amateur works a new distant station, he telephones all his friends and makes schedules for them. If a new hookup is evolved, or a new adjustment discovered that improves performance or efficiency, it is immediately passed on at the local radio club, or in the pages of an amateur magazine. The slightest advance in technique, every individual discovery, any observation that promises improvement, is immediately the property of all.

"Amateur radio has traced a story that cannot be compared with any other in existence. It has no analogy, nor can we find any similar group in contemporary or past civilizations."

Through the course of many centuries man has devel-



1936 National One-Ten VHF receiver (30-300 MHz) with rf amplifier, superregenerative detector and two stages of audio. Photo courtesy W1HR.

oped the knowledge necessary to understand even the simplest principles of science and industry. Thales in 600 B.C., discovered the peculiar properties of amber. Fifteen-hundred years later Dr. William Gilbert took the word "electrum" or "amber" and derived "electra," referring to substances that attract. The actual word "electricity" did not appear until forty-six years after Gilbert's death. The science of electricity attracted many experimenters, and over the next three centuries theory and practice contained far-reaching ramifications.

One day in the summer of 1865, on a mountain in West Virginia, a group of men sent aloft a kite bearing a large square of light copper gauze. Toward the earth trailed a slender copper wire. On another mountain eighteen miles away a similar kite flew at the same elevation.

Dr. Mahlon Loomis, a Washington, D. C. dentist, opened the copper strand that connected, through a galvanometer, to a coil of wire buried in the earth — and the other galvanome-

ter, similarly connected eighteen miles away, quivered!

This is generally believed to be the first aerial telegraph using only natural static for operating power. Loomis tried to obtain popular recognition for his work, but he experienced a staggering series of setbacks and died in 1886. However, he should be remembered for one contribution — the aerial — which he himself named, and in the use of which he was the first by twenty years.

In 1886, Heinrich Hertz discovered that a spark could be made to jump across an air gap between two wires, and that a second spark was caused in an induction coil and another spark gap.

Numerous other experimenters were involved in the effort to use the principles of induction to signal ships at sea and for telegraphy, but it remained for Hertz to lead the way out of the labyrinth with his theory of radiation as opposed to mere induction.

The next experiments by Hertz were efforts to detect electromagnetic waves after they had been transmitted across space into the resonator, or induction coil and spark gap circuit.

The Father of Radio

On April 25, 1874, Guglielmo Marconi was born in Bologna, Italy. During his youth he studied at the Leghorn Technical School. He became an early disciple of Professor Righi of the University of Bologna who had been experimenting for several years with inductive telegraphy. Marconi began experimenting at his father's large estate just outside of Bologna. From that work grew the art of radio as we know it today.

Marconi did not invent anything new. He simply adapted the inventions and discoveries of others, discarded some laboratory defects, and retained the more pertinent bits of knowledge that had accumulated through 2500 years.

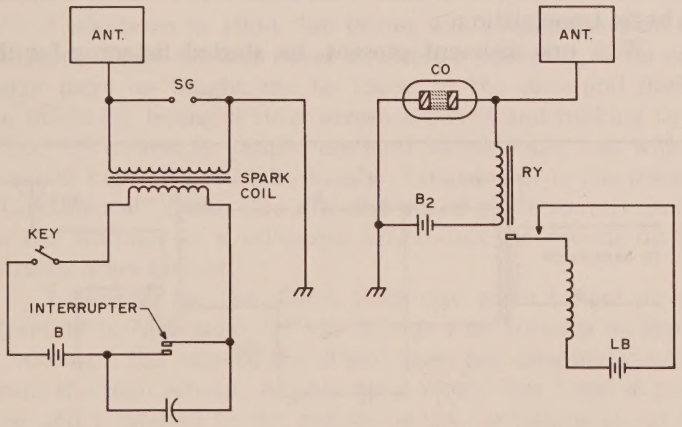
He took the Righi version of the Hertzian oscillator for his transmitter, and used the coherer (a tube filled with metal filings discovered by Hughes in 1878) for his receiver. But, most important he adopted modified versions of Loomis' aerial and radiated the oscillations along the surface of the earth for increasingly greater distances.

In 1896 he took the entire system to England, and there he sent and received a wireless message over a two-mile distance. This drew the attention of the scientific world.

He had patented the coherer, much to the resentment of Branly, who had rediscovered it from Hughes, and of all the men who had spent so many years in experimentation. They called him a charlatan and said he had never invented anything of his own, but had simply used others' findings to make himself, at twenty, the father of radio. While this was true, it was also true that no one up to that point had synthesized all of these inventions into a workable communications system.

Meanwhile, Marconi proceeded with his experiments. He increased his range, first to four miles. By the end of 1897, he had communicated between ships ten miles apart at sea. He improved his receiver by using Sir Oliver Lodge's device of inserting a transformer between the aerial and the coherer; he celebrated by bridging the English Channel, 32 miles, at the invitation of the French government.

By 1900, he came to realize the necessity of matching the transmitting and receiving circuits, and by 1901 he was ready for his greatest test — the spanning of the Atlantic.



Early Marconi transmitter and receiver.

During this time amateur radio was already developing. Neighborhood telegraphy experimenters were fascinated by the possibility of signaling without the use of wires and were eagerly reading of Marconi's early experiments. The articles in the scientific magazines were devoid of any information on construction, but in July, 1899 the *American Electrician* carried the first actual construction information on wireless, and it was hailed as a great find by amateurs everywhere.

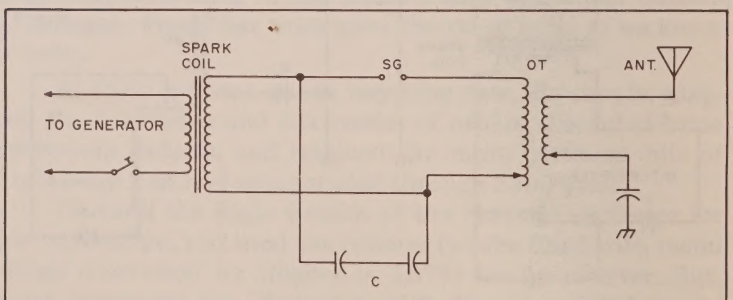
In 1900 Thomas Clark, later to become one of the best known suppliers, and the builder of a large continental wireless system, began the manufacture of wireless apparatus and issued the first wireless catalog.

But in 1901 an incident came to pass that really initiated the widespread development of all radio. On December 6, Marconi arrived from Europe at St. John's Newfoundland with two assistants, and proceeded to erect the most advanced wireless receiving station of the time in the old Barracks of Signal Hill, at the mouth of the harbor.

On December tenth he sent up a nine-foot-long hexagonal kite made of bamboo and silk. The wind snapped the trailing wire and the kite drifted out to sea. The next attempt was a fourteen-foot hydrogen balloon, but this, too, broke away and floated off into the fog.

Finally, on December twelfth, a kite went aloft to 400 feet and held. Marconi cabled his station at Poldhu, Cornwall to begin transmitting.

With one assistant present, he started listening for the



Later Marconi apparatus.

signal, a pre-arranged letter "S." The transmissions were to begin at 11:30 a.m. Just before noon he heard a repeated trio of buzzes in the headphones — three dots — the letter "S." His assistant verified the reception. Twice in the early afternoon the signal came through.

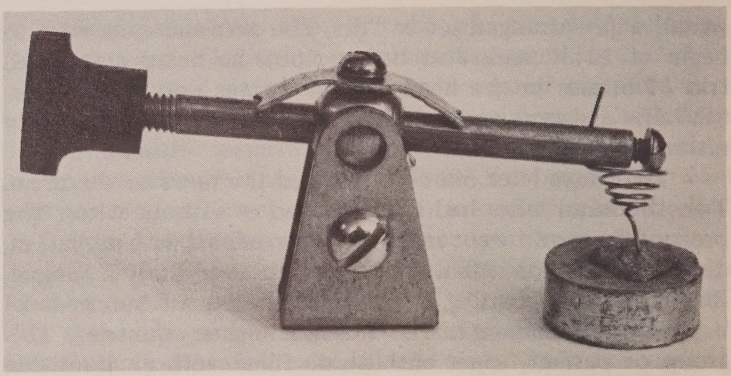
Two days later Marconi released the news to the press. Two thousand miles had been bridged — without wires. The press of the world went mad. Pages were filled with jubilation, disbelief, triumph. "Wireless" was on everybody's tongue. But most importantly, it filled the hearts of hundreds of backyard experimenters in this and other countries. This group of patient, eager enthusiasts filled with an insatiable curiosity and undaunted by a thousand failures turned from their wet cells and electric motors and perceived that here was something a hundredfold more exciting than all the other hobbies. They plunged into wireless.

In the years from 1900 to 1904, American popular magazines contained 115 articles on wireless telegraphy. These were not technical magazines but such periodicals as *Cosmopolitan*, *Woman's Home Companion*, *Atlantic Monthly* and *Harper's Weekly*. Many of them even contained construction information.

Starting Out

I was born in 1904. My father was a telegrapher on the railroad. While he was never a wireless operator, from very early days he taught me to listen to the dots and dashes he made by laying a ruler across a pencil and making them click. Of course he taught me land Morse code, and when I reached high school I laboriously changed over to the present "Continental" code. The rule and pencil made sounds similar to the sounder in a telegraph office, but the sounds on the wireless were buzzes.

I lived in Dayton, Ohio. Each day when I went on the streetcar to high school, I saw a large wire antenna on top of a house on the edge of the Miami river, just diagonally across from the high school. At that time World War I was in progress and I listened to the people on the car talking about the radio operator with that big antenna who had to shut down his station when the war started. His name was Stanley Copp, and many years later, when I became a licensed ham, I got to



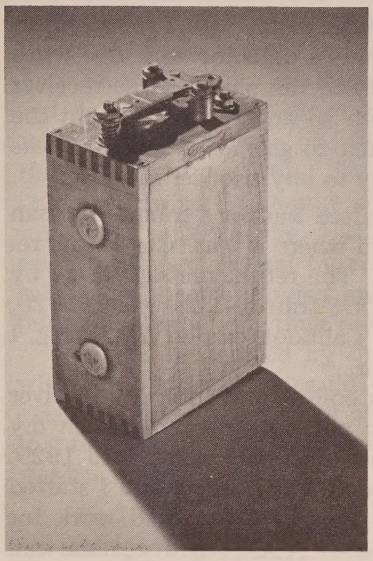
Early crystal set with lead galena crystal in soft metal holder and the "cat's whisker." Photo courtesy W1HR.

know him. He had a store where he sold and repaired radios.

The same year I started to high school I also joined a Sunday school, and somehow I was put in a class where every member also happened to be an amateur radio operator. I think I got there because of my interest in telegraphy. We had a real hamfest every Sunday, and I could hardly wait until I could get a station and a license. Several members of the class were older than I and one had even been a commercial operator. The Sunday school teacher was not interested, but he tolerated our mania because it ensured our perfect attendence.

One of the members of the class was Paul Jackson, who later founded the Jackson Electrical Instrument Company and became a successful manufacturer. He lived about a block from me. Together we devised a means of communication. We each installed electric lights on telephone poles behind our houses, and ran the power out to each light through a key. We would communicate by flashing our light in code. They were far enough in back of our houses so that we could each see the other's light.

One day I was experimenting with an arc light using a chemical rectifier. I found that, if I connected the arc to one side of the power line and the other side to the ground, it did not run the meter, nor would it blow fuses. It did, however, dim all the lights in the block. It scares me now to think of it,



The famous model "T" Ford spark coil. More early hams used this for their transmitter than any other type of power source. It was also used as the "B" supply for some early tube transmitters. Imagine a Ford spark coil transmitter using two UV 201's in parallel! Photo by AWA.

but we decided that it would be an excellent calling method. Whenever the lights dimmed, we would go to the window and start transmitting.

Finally, in 1919, when the amateurs were allowed back on the air, we scrambled to get licenses. A friend got 8TN, but I was too slow and missed the two letter calls. I got 8ADD.

I started out with a Ford spark coil, a galena detector and a four-wire antenna between a tree and my house. The very first thing I did was to climb that tree, and step on a dead limb about twenty feet up. It broke. I fell, hitting a couple of other branches on the way down. When I came to I was wrapped in tape; they told me I had broken two ribs and cracked a collar bone. I spent the next six weeks working part-time on my new transmitter — a 500 watt spark outfit with a rotary gap that gave out a beautiful 800-cycle note. I used to throw the switch and call while the rotary was picking up speed, and when the contact was over I signed with the rotary gap slowing down. Everyone did the same.

My transmitting capacitor was made of Delco Light battery jars filled with oil, with plates made of ¼" plate glass with foil attached, held on by shellac. It made quite a racket

in the radio room, but it was music to my ears. I soon acquired an Audiotron tube, which was a detector with five wires protruding. They were attached to the panel of the receiver in binding posts. The tube cost $8 and I burned it out the very first day. I had to go back to galena crystal detectors until I could save enough money to buy another tube.

The first message I transmitted was for a friend to a man in Denver. I sent it across town where it was relayed and re-relayed until it finally arrived. The return message came by mail, but I had handled my first traffic. This was in 1920, and the spring edition of the Callbook carried my listing. I was really a full-fledged amateur.

In 1921, I went away to college and took my receiver with me, but of course could not possibly have taken my transmitter. I lost close contact with ham radio until 1929. That year two things happened: I was married and I started to build equipment again. I went to Chicago to work for KYW radio after two years with AT&T, and got the call W9KRI. I ran about 10 watts with an antenna on top of my apartment building, three blocks from Lake Michigan. I used to work the East Coast at night on 80m. I got my class A license but never worked AM phone. In the years that followed, I always worked CW and never with more than 20 watts, although I worked New Zealand every Sunday morning on 20m. This was the case until 1964 when I got a SSB rig, but more about that later.

Legislation

For about twelve years, beginning in 1900, the early amateurs operated without regulation. But by 1909 their problems with the government had grown so big that something had to be done. The amateurs had much more power and equipment than even the Navy, and they completely disregarded the complaints of commercial operators. These amateurs looked down on them because of their inadequate equipment. There were hundreds of powerful amateur stations; the Navy and commercial stations numbered only twenty percent of the total.

There were many bills introduced to control them, but the amateurs found an advocate in the Marconi Company. The company's position was that if the Navy would buy Mar-

coni equipment, its troubles would be over. Then Navy tuners would be as good as amateur rigs.

Amateur radio was surprisingly important at that date, and was quite the topic of the day. There were 4000 amateurs by 1910; Boston had 300 members registered with the Harvard Wireless Club. The January 15, 1910, issue of *Outlook* carried a five-page anti-amateur radio article on the subject of interference. New York, Boston and Baltimore each contained several hundred amateurs. Three magazines catered to these hobbyists and several manufacturers made a business of supplying their gear.

It was recognized by this time that so many amateurs with such enthusiasm could not simply be legislated out of existence. Even the author of the *Outlook* article recognized this fact, and suggested that some sort of wavelength division was the probable solution.

In 1912, a London conference was held to discuss the governing of the new industry; detailed regulations were drawn up. The congress, having received a confidential report of the new rules, hurriedly made out a new bill, or rather, amended an old one, and followed almost exactly the regulations brought back from the conference — with one tiny difference. This was Regulation 15, which specified that private (amateur) stations could not use wavelengths in excess of 200m without special permission. Among the provisions deleted due to the objections of the Wireless Association of Pennsylvania were those regulations requiring licenses for receiving sets, and those which made it possible to arrest an amateur for violations of the regulations without first giving the amateur a warning and an opportunity to desist from violating the law.

Radio had a law and the amateurs had 200m. The bill was signed on August 9, 1912.

The congress figured as follows: limited to one or two wavelengths in a region whose communication capabilities had been proven unreliable, inefficient, and weak compared to the long waves, how could the formerly unchained amateur radio freebooters survive since they could no longer roam wildly over the entire territory below 1000m. They reasoned that slowly its members would lose interest. Soon the thousands of amateurs would be reduced to hundreds, and then . . . Fortunately destiny took a hand.

By the end of 1913, only two thousand licenses had been issued. A large number of amateurs simply neglected to get licenses, and continued on their way. They found that if they were courteous with government and commercial stations, they were not likely to be bothered. Even those who got licenses discovered that 200m could be anything from 250m to 375m and "one kilowatt" could be stretched to two or three without too much danger. These amateurs benefited from the lack of funds the law enforcement agencies had to work with. The Secretary of Labor and Commerce was required to issue licenses to all who asked for one. The most stringent penalty was the requirement to be quiet for the first fifteen minutes of every hour. As soon as their internal organization attained sufficient strength, amateurs formed their own policing policies in self-defense.

Improvements

By the time enforcement became strict enough to actually confine the amateurs to 200m, the audion bulb (invented by deForest in 1905), hitherto ignored by amateurs because of its expense and dubious superiority over their crystal detectors, had become better understood. This resulted in many improvements being made in circuits. Armstrong invented the regenerative circuit. This increased the magnification with the audion tube many times, and was probably the greatest improvement since the invention of the vacuum tube itself. He saw that by feeding a portion of the signal back through the tube repeatedly he could obtain tremendous amplification. He thus revolutionized the entire art of radio.

Only one can lead, the rest must follow. The amateur world began to put the fruits of Armstrong's research into practice. By this time the experimenters were outnumbered by those who just wanted to communicate. Amateurs began to adopt commercial methods in handling messages. Soon they were not only holding personal conversations but were sending friendly messages, not only for themselves, but for others. The busy airlanes' whole character was changing.

In March 1913, a possible new activity arose when amateur stations bridged the communications gap surrounding a

large isolated area left by a severe windstorm in the Midwest. Amateur stations at the University of Michigan in Ann Arbor, and at Ohio State University, along with many incividual amateurs in and around the stricken area, handled widespread communications from March 24 to 31.

Message handling for pleasure, for friends, and in time of emergency was rapidly becoming the predominant theme in amateur radio. It was shortly to assume an important position in the development of an amateur radio organization of truly national character.

The American Radio Relay League

In January 1914, the scene of destiny in amateur radio shifted to Hartford, Connecticut. On January 14, the first meeting of the Radio Club of Hartford was held. At that time this organization was just one of many radio clubs which had sprung up throughout the country during the previous four years. In the chair was Hiram Percy Maxim, a brilliant engineer, famed for his work in the development of the automobile, and for his invention of the Maxim silencer. He had become interested in amateur radio in 1907 through the activities of his son. Temporary secretary of this first meeting was an eighteen-year-old amateur named Clarence Tuska. During the meeting David L. Moore was elected president. Bimonthly meetings were scheduled. A constitution was drawn up and adopted at the next meeting. The attendance at the charter meeting was twenty-three members. By March 9, the attendance had increased to thirty-five.

Again destiny took over. At that time the demand for vacuum tubes had risen to a peak as a result of the publication of the Armstrong regenerative circuit. Because of this great demand and limited supply it was no longer possible to walk into the deForest Radio Telephone Company, pay five dollars, and walk out with a precious audion. Therefore, although eager to purchase an audion H. P. Maxim had not been able to do so. However, he learned that an amateur in Springfield, Massachusetts, had an audion for sale. That night he sat down at his transmitter and attempted to raise Springfield. His one-kilowatt station, 1WH, at that time had a range of one-hundred miles, but under prevailing conditions he was unable to work ground wave the thirty miles into Springfield.

He pondered the problem and thought of a solution. At a club meeting he had met a young man from Windsor Locks, a small town between Hartford and Springfield, who had said he had a transmitter on the air. The terrain was such that his station could work both cities with ease.

Maxim called the station and asked the young amateur to relay the message to Springfield. This done, he sat down, puffed his pipe and pondered some more. The next morning, while driving to his office he thought more about the incident. The relay itself was not an unusual feat, since ships at sea had done it. Amateurs themselves had done it before. The Central Radio Association (from the Rockies to Ohio) had relayed messages over hundreds of miles. A germ of an idea was in his mind for a much-needed national amateur radio organization. The relay idea seemed like a perfect basic principle to gather together the amateurs of the country.

Experience had shown that merely having a club, even with certificates and one's name on the rolls, was not enough. Distances were limited on 200m and even increasing power was inadequate. Amateurs were limited to one kilowatt, and even two or three would not substantially increase the dis-

Amateur radio 3AEP—1916. Photo courtesy Smithsonian Institution.

tance. But an intermediate amateur could easily relay messages over great distances. Organization was needed — organization that would serve a dual purpose. It would open the facilities to all, and would form the amateurs into a strong self-reliant body.

Maxim and Tuska wrote letters to every amateur they knew; in addition to announcing the formation of the American Radio Relay League, they enclosed an application blank. There were no dues, but relay stations had to meet high standards and maintain them. The response was tremendous. Soon the League had members in every section of the country. There was a route from Hartford to Boston, and one from Boston to Denver was being organized.

By August 1914, more than two hundred relay stations had been appointed from Maine to Minneapolis and from Seattle to Idaho.

In September the League published a map of the United States showing the location of 237 stations in 32 states and Canada.

In October the League published its first callbook, a *List of Amateur Stations*. It was a little blue book showing the names, addresses, calls, power, range, receiving speed, and operating hours of 400 stations.

The one-kilowatt stations claimed distances of from 50- to 350- miles. Ranges of the smaller stations were listed from 10- to 20-miles with powers from 10- to 100-watts. This callbook, the United States map, seven state maps, and a pad of 50 official message blanks were sold for 50 cents. This left little profit, so the members of the League were finally assessed 50 cents a year for "station dues."

By the end of 1915 the amateur stations, with gear usually not exceeding one-hundred dollars in cost, were frequently outperforming the multi-thousand dollar commercial plants and doing it in the "useless" 200m region. Several kilowatt stations now showed ranges of one thousand miles.

However, the League was in need of a method of better organizational contact. It was finally decided to publish a magazine.

In December 1915, each member of the League received in his mail a copy of a sixteen-page periodical called *QST — The December Radio Relay Bulletin*. It was announced that it was being published privately at the expense of Maxim and

Tuska. It was to be sold independently of the League, and the subscription price was one dollar per year. The stated objective of the magazine was "to maintain the organization of the American Radio Relay League and to keep the amateur wireless operators of the country in constant touch with each other."

War

In August 1914, the European War began. The initial effect on the United States was largely social, but in 1915 the government began to take notice of violations of our neutrality. One of these reported violations concerned the operations of the Telefunken radio station WSL at Sayville, Long Island, New York. Unfortunately, the government secret service was unable to confirm the allegations through their usual channels despite the three censors watching the Sayville station for violations.

Finally, on June 4, 1915, Chief W. J. Flynn of the United States Secret Service Bureau received instructions from Washington to make a full investigation to determine to what extent the Telefunken station was non-neutral in its operations. With no knowledge of radio and in doubt about the proper procedure, he appealed to Radio Inspector, L. R. Krumm at the customs house in New York.

Then occurred one of those curious coincidences that make history so fascinating. The previous night Krumm had visited the home of Charles E. Apgar, 2MN, an amateur in Westfield, New Jersey. Apgar had started in amateur radio in 1910 and had begun experimenting with advanced receiving equipment when he tired of orthodox communication. Later he became interested in making phonograph records of wireless signals, with a special device incorporating an elaborate junction between the diaphragm of a telephone receiver and a Dictograph.

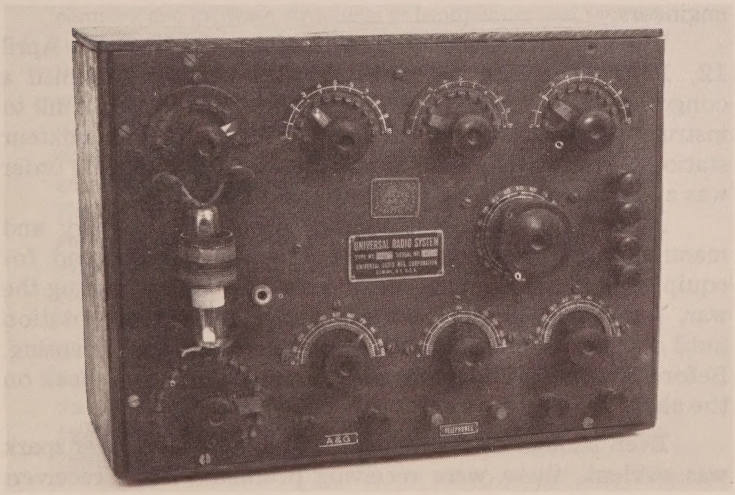
Krumm had seen this device in operation, and had listened to records made with it. When Chief Flynn made his request, Krumm's thoughts leapt back to Apgar's work, and he telephoned Apgar to come to his office as soon as possible.

The investigation was begun immediately. Sayville's transmitting period to POZ (Nauen, Germany) began at

11:30 p.m. and usually lasted until 1:30 a.m. or later. Apgar would record each night's transmissions and rush them down to the Secret Service office for checking. It soon became apparent that the station was sending information concerning Allied and neutral shipping to submarines at sea. After three days work Chief Flynn confided to Apgar that the Telefunken station would be taken over by the government. This was done, and the equipment was confiscated. Eventually Dr. Karl George Frank, the general manager, and Dr. J. Zennick, head of operations and one of radio's most famous engineers, were interned in Atlanta, Georgia.

On July 8, 1915, the tale of Apgar's assistance to the government was released to the press. It was described as "the most valuable service ever rendered by a radio operator to this country."

In June 1916 two brothers, Howard and Lyndon Seefred, operators of 6EA, were appointed Pacific coast trunk line managers. The eastern and central managers had been appointed in March. By the end of the year more than 150 cities were linked by these trunk lines with branches completing the national coverage.



Mignon RW-3—one of the earliest factory built receivers—1917. Photo courtesy W1HR.

On February 6, 1917, a message was started from the east coast, relayed to the west coast, and an answer received in the record time of one hour and twenty minutes. It travelled via New York, Cleveland, Jefferson City, Denver and Los Angeles. *QST* predicted that before the summer was over it would be done in twenty minutes, since the nets were so well organized that there were three routes for a transcontinental message.

On February 28, 1917, the League was reorganized, with six districts, twelve directors, and four officers. They declared the membership open to anyone interested in radiotelegraphy or radiotelephony. But in April all licensed amateurs received notices from the government that every station had to be closed down, all receiving and transmitting apparatus had to be disconnected both from the aerial and the ground, and all aerials had to be immediately lowered. Even dummy antennas were barred. Amateur radio was dead for the duration of the war.

Tremendous strides were made during the war years due to the extreme competition between opposing forces. The most important improvements were the cascading of high gain vacuum tube stages for receiving and the use of tubes for transmitting — ideas which had not before occurred to engineers.

The ban on receiving was lifted by the Navy on April 12, 1919. The ban on transmitting remained on until a congressman, the Hon. William S. Greene, introduced a bill to instruct the Secretary of the Navy to lift the ban on amateur stations. This was done on September 26, 1919 and the order was a joint resolution by the House and Senate.

A wave of wild enthusiasm swept the country and manufacturers were hard put to supply the demand for equipment. Since all amateur licenses had expired during the war, temporary permits were issued with calls in rotation until the frantic clerical staff could catch up with licensing. Before November 1919 was over, amateur radio was back on the air.

Even though the superiority of vacuum tubes over spark was evident, there were receiving problems. Most receivers simply would not hold the narrow CW signal. Even moving one's hand to the tuner would cause the signal to be lost. But after France had shown that a 5W tube would out perform a

½kW spark set, the spark's doom was fixed. However, it persisted several years longer, even after the invention by John L. Reinartz, 1QP, of a special tuner for CW signal reception.

In late 1920, amateurs in large cities turned to a new activity — amateur police radio, forerunner of the present city and state police radio. Their reports of stolen cars were picked up by police and by other amateurs.

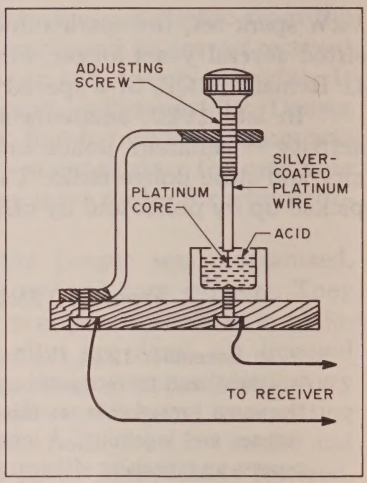
From 200 Meters and Down

In December 1920, the first Midwest ARRL Convention was held, and there was brought to light what was probably the most remarkable recorded instance of amateur perserverance and ingenuity. A young lad of seventeen, known to possess an especially efficient spark, CW and radiotelephone station, was discovered to be the son of a laboring man in extremely reduced circumstances. The son had attended grammar school until he was able to work, and then he assisted in the support of his family. They were very poor indeed. Yet despite this the young lad had a marvelously complete and effective station.

How had he done it? The answer was that he had constructed every last detail of the station himself. Even such complex and intricate structures as headphones and vacuum tubes were homemade! Asked how he managed to make these products of specialists, he showed the most ingenious construction of headphones from bits of wood and wire. To build the vacuum tubes he had found where a wholesale drug company had dumped its broken test tubes, and where an electric light company had dumped its burned out bulbs. He had picked up enough glass to build his own tubes and enough bits of tungsten wire to make his own filaments. To exhaust the tubes he built his own mercury vacuum pump from scrap glass.

His greatest difficulty was in securing mercury for his pump. He finally begged this from another amateur. The tubes were good ones — better than many commerically manufactured and sold. The greatest investment was twenty-five cents for a pair of cutting pliers. His was the spirit that has built amateur radio.

When I first read this story I wondered if, by chance, I had had anything to do with this venture. In Feburary 1920,



Electrolytic detector invented by Fessenden.

I had an article published in *Radio News* on how to make your own vacuum tubes from test tubes. I didn't use a mercury pump in my article. My method was to simply use a column of mercury more than thirty-two inches high, then tip the whole affair over and let the mercury fall to create a vacuum in the tube, which was then sealed off. I still remember that my article was used intact except for one word. I had said it would create a "perfect vacuum" and the editor changed that to "good vacuum." Since that was nearly sixty years ago, I don't remember any more about it. It makes getting your rig with a downpayment nowadays seem pretty simple.

I wrote another article in 1920 for *Radio News* about what was the equivalent of the "B" eliminator. I had the rectifier circuit for the plate supply of the receiver, and I used a center-tapped resister across the filaments to balance out the ac hum. Some years later, I read that the Philadelphia Storage Battery Company was suing the General Electric Company, I believe it was, for ten million dollars, for infringement on their patents for the "B" eliminator. I watched closely, because I planned that if a large award were involved I would tell the loser that I could blow the whole case. The patent date given in the case was November 1920. I could prove that my article, published in February 1920, had made the circuit

public domain. I had held rights to the article for two years, and then it had become public property. But my hopes for a large settlement were dashed when the judge ruled that it was not an invention; it was merely a use of known circuits in a new application.

The Good Old Days

by Myron E. Lawson

reprinted from Spark Gap Times

The kW transceiver on the desk before me awakens memories of its many predecessors back to that first UV-202 "5 Watter" in the Hartley circuit forty-six years ago, and renews my amazement at how far we have progressed. When I received the call 5ACL in Dallas in 1923, there were still several spark stations in the area. The only available transmitting tube that most hams could afford was the 202. Because dc plate power was either too great a nuisance or too costly, a number of stations used raw ac. The more fastidious used two tubes in push-pull to have a 120 cycle tone. Sixty cycle ac was not available in all communities. I recall a beautiful warble a buddy in Arlington, Texas, emitted with his rectified and filtered twenty-five cycles. Later, when intercontinental QSOs began, numerous foreign stations stayed with ac plate power. I remember how old pioneer DXer 0-A3B in South Africa would begin gargling up out of the background until he peaked at about S6 T2.

Even now I dislike remembering my first — and last — chemical rectifier. It was a forty-eight-jar unit under the house, strung out on planks. Strips of aluminum and lead had to be cut and drilled and then a strip of each metal bolted together and bent "U" shaped to hang over the lips of two jars. Then the jars were filled with a saturated solution of soda in distilled water. Before the plates "formed," the rectifier had very low resistance. The favored procedure for forming the plates was to put a penny beneath the house fuse, grasp the insulated 115V ac wire, close the switch for a few seconds and open it when the wire got hot. Three or four cycles of this would complete the job. After that, all I had to do was check for evaporation about once a week and add distilled water as required and scrape off the white crust that would creep out of the jars and up the electrodes.

About every six months it was necessary to dismantle the whole thing, wash the jars, prepare a new solution and replace the electrodes. No wonder one of the local hams threw out his chemical rectifier and bought 600 Volts of "B" batteries! Several years later when the first low-voltage-drop rectifier tube, the mercury vapor 866, became available, the price was $7.50 each.

Before we made it across the oceans, QSOs over more than a few hundred miles were the exception. This, together with the relatively few active stations and the emphasis on traffic handling, bred a closer-knit fraternity than was possible in later years. We could usually identify the operator by his fist and the individuality of his signal.

While government controls were still rather loose, the Fifth district radio inspector in New Orleans visited Dallas at least annually to give examinations and inspect stations. Separate call letters were issued for portable operation. Mine was 5 ATL. For a while I used a borrowed World War I ¼kW airplane spark that had its own portable call. The banshee scream of its rotary gap could be heard two blocks away. I recall asking a 9 what wavelength I was on. He replied, "I can't tell, OM. I hear you all over the dial."

While most work was on CW, voice, with a carbon button connected to a loop in the transmitter's inductance, was surprisingly effective. The replacement rate on carbon buttons was rather high and the badge of a phone hound was rf burns on the tip of his nose. Loop modulation worked well enough for me to snag two Europeans on phone.

When the 80m band was first opened, and later for the first few months on 40m and 20m, one had to search hard for someone to talk to. I used to leave 40m and go back to 80m in order to have a QSO. DX was pleasant for a while on 40m when the DX countries had their slot just above our band.

Soon after the opening of 40m and 20m we learned to remove the high loss "bakelite" bases from our 5 Watters and solder the four leads directly into the circuit. A few brave souls wired them suspended upside-down in oil and crammed in 50 Watts or more. No tube was considered adequately loaded unless the plate glowed a bright cherry red. One school of thought believed a brilliant white about right.

RCA'S introduction of the UV-203A "50 Watter" caused quite a stir. It had a ceramic disc in the base for the pins, and a ceramic socket was available. The original price, if memory serves, was $48.50, a small fortune in those days.

Replica of a 1923 amateur station in the Antique Wireless Association Museum. Notice the old "slop jar" rectifiers below the UV 202 and UV 203 transmitter, and the honeycomb coils on the receiver. Operator is Elliot Sivowitch K3RJA. Operator standing is Harry McConaghy W3SW.

I drove old buddy 5AKN over to Fort Worth to buy the first one in Dallas. We were informed that the tube carried no guarantee. After cradling it in his lap all the way back, and gently placing it in the socket in the rig, the filament lasted just long enough for a glance at the Jewell 0-10 ac voltmeter to verify that the filament voltage was correct. Back we went for another one. It was a much better tube. The filament lasted nearly three hours! Again to Fort Worth. Eureka! The third time was the charm. I was lucky in that my first one was good and gave years of faithful service.

The 203A went into a Hartley circuit assembled on the right end of the operating table. The two inductances were coils of flat copper ribbon supported on glass towel rods. Plate power of about 800 Vdc came from two dc motors wired as generators in series, each coupled to a one-half horsepower Century motor.

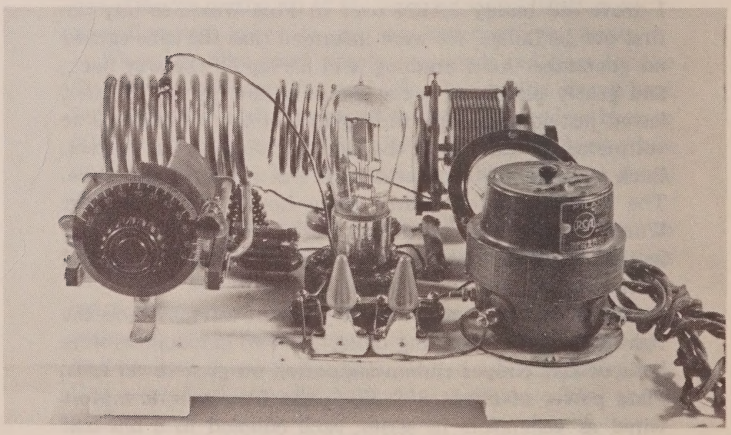
The big marble-base key with half inch silver contacts was in the negative high voltage lead. This lethal arrangement was accepted practice. A high wattage resistor across

the key reduced arcing and gave me a nice half-strength commercial style back-wave near the main signal. Back-waves were quite fashionable then. The receiver was an exact copy of the famous Schnell Tuner described in *QST*. If this sounds crude to the young squirts, let me say that it was good enough to make *QST's* "Amateur Stations" page with photo and description, and was used in obtaining the first WAC certificate in the Fifth District.

Those early regenerative detector receivers deserve a word or two. They were usually open breadboard and bakelite panel construction and hand capacity was both nuisance and convenience.

It was the latter when the hand was used as a vernier to follow a drifting signal. Strong local signals would block your detector tube. This often led to either time-sharing or dog-eat-dog contests among the locals. Those oscillating detectors could be heard for miles. We worked each other across Dallas with keys in our "B" battery leads. Although we had never heard of the word, we were using the first transceivers.

The antenna was an almost vertical four-wire cage, worked against a ten-wire fan counterpoise about seven-feet above ground. At that time we knew very little about rf current distribution on antennas, and didn't realize that we



Early CW transmitter of 1924-25 using single UV 202 in Hartley oscillator circuit. Note the Christmas tree lights used for filament center tap! Used by 8BJI/W2BJI. Photo by AWA.

were bringing the strongest radiating portion of the antenna into the shack.

The lighting of bulbs in one or more rooms in the house and using a lead pencil to draw sparks from the pins used to hold QSLs to the wall were accepted as standard operating practice. If an antenna wasn't stretched very tight it would swing in the wind and cause the signal to swing. This became so annoying one evening that I tied the antenna lead to the springs of a bed in the room. When I worked a ham in Atlanta he commented on how steady my signal was. My explanation that the bed was not occupied at the moment brought a "Pls rpt OM I didn't get that."

Soon after the first West Coast-Australia/New Zealand contacts, I had made the grade with a pair of de-based 5 watters in a t.p.t.g. rig which one flatterer "down under" had said was consistently the loudest pair of 202's coming across. I could hardly wait to check on him with the new 50 Watt rig. He said, "Sorry, OM, there are 50 watters louder than yours."

It was during this period that OT Soupy Groves, 5NW, would occasionally come down from Denton and we would take turns sleeping and keeping 5ACL on the air all night.

Quality components were still scarce and expensive in 1925-26. I remember paying four dollars for an eight-inch "Ohio Brass" glazed porcelain insulator — about the first good antenna insulator to appear on the market. It supported the top of my eighty-five-foot cage. I had the sad experience of looking up at it during Dallas' all-time worst hailstorm, hearing it pop when an egg-size hailstone hit it, and watching the cage fall.

I treasure the memory of two rewarding mornings on 40m. It was bitter cold December 7, 1927, when the alarm buzzed at 4:30 a.m. When I donned those icy headphones and tuned the silent band I heard a swinging 400 cycle signal calling "CQ de AQE." I assumed it was a ship station because in those pre-crystal control days the roll of a ship would vary the distance of the antenna from the water and this capacity change would cause the change in the frequency of the signal. By today's RST scale the signal was about 565. AQE responded to my call. The operator said that the ship was the *Sir James Clark Ross* in the Bay of Whales, Antarctica, 78°30' south, that they had been out of touch with civilization for over three weeks, and asked if I could take urgent messages for one of our Naval stations on the East Coast and to the ship's officers' families in Norway. I QRV'd and took the messages. On a schedule

arranged for the next morning, I took messages for members of the crew to their families. I agreed to be there the following morning, but when I found AQE he was filing traffic with a 5 in New Orleans. I listened until AQE faded out. Although I monitored the frequency two or three times a week for some time I didn't hear AQE again.

In May 1926, I received a big fat envelope postmarked "Canal Zone." It contained twenty-four photographs of the ship, her fleet of whale chasers and whales, and several spectacular shots of the Ice Barrier where, in later years, Admiral Byrd established Little America. Also enclosed were letters from the ship's Master, First Officer, and Chief Radioman expressing appreciation for my assistance and requesting the same help on their following year's voyage. Later, from Norway, I was sent the timetable for the next sailing. Now for the anti-climax! Although I heard AQE a few times we could never make contact. This caused AQE no inconvenience, however, because in that one year shortwave technology had progressed so rapidly that AQE had no trouble working into the United States and Europe, including Norway. My limited research indicates that the *Sir James Clark Ross* was one of the pioneers in developing the modern factory-ship technique for whaling in the Antarctic.

As late as 1946, a few days before I left New York for my present home, I read in the paper under "ship sailings" that the *Ross* had just departed New York for Norway on a return voyage from Antarctica. Had I known that she was in port I would have gone aboard and inquired if any of the 1925 crew were still with the ship.

We all worked ships regularly. I have a QSL for one of many QSO's with GDVB, the *RMMS Aorangi*, bearing a color picture of this luxury cruise ship which plied the Pacific. G2KG was the chief radio officer and G2KC was the second of four. They used the ship's antenna on 37.5m. ARRL's Fred Schnell put a ham station on the *USS Seattle*, and during an extensive Pacific cruise opened the Navy's eyes to the DX capabilities of the higher frequencies. I have this NRRL card for a QSO on May 1925 while the *Seattle* was in Honolulu.

Chats with commercial stations were not uncommon. My first Japanese contact was with JKZB, a Tokyo Electric station. I have the JKZB QSL. I also have cards from HIK in the Dominican Republic and RDRL, Central Radio Laboratories, Leningrad, U.S.S.R. I have a letter from the staff of a commercial station in Central America acknowl-

edging our QSO and asking me to call again when they would have their new 15 kW transmitter in operation.

Before anyone gets the idea that we were wandering around outside the amateur bands working commercials let me hasten to explain that it was the other way around.

Outposts of our armed forces apparently selected whatever call letter struck their fancy for use on the amateur bands. I have cards from FXI, Signal Corps Experimental Station, Fort Shafter, Honolulu, and 99X U.S. Naval Air Station, Coco Solo, Canal Zone.

Other treasured QSL's include Z-4AA, OM Bell in New Zealand for a February 1925 QSO. He was the first Australian to work the U.S. and the first to work Europe. Also Z-2AC (March 1925), Ivan H. O'Meara, who was second across, and CB8 (February 1925), Carlos Braggio of Argentina, who was the first South American to work the U.S.

We used to talk to the radiomen in large dirigibles — the *Akron*, the *Shenandoah* and others — as they floated over the country. I recall talking to one while I watched it sail past my window.

The UV-203A later went into a deluxe t.p.t.g. rig with silver-plated copper tuning coils for each band. It was assembled on a wooden base with a seven-inch panel on the front edge of maple wood boiled in paraffin and was powered by a husky Thordarson transformer with vacuum tube rectifiers in push-pull. That rig was followed by a pair of 852's in t.p.t.g. mounted on pr...ter's furniture as described in *QST*.

About this time I discovered the so-called weaker sex, and began to finance dates by selling a transformer here and a meter there. This attrition continued until the input at W5ACL was zero and the XYL said "Yes."

The next rig, crystal controlled, ended the era of self-excited transmitters and brought to a close the days of panel-breadboard receivers and hand-wound basket-weave coils.

Navy Radio

Some of the early amateurs had better equipment than was in use by the United States Navy. In 1925, the Navy secured the services of Fred H. Schnell, W4CF, traffic manager of the American Radio Relay League, to conduct tests on short waves during a seven month cruise to Australia. The Navy had been astounded by amateur use of short waves and

wanted to investigate ham techniques. Schnell was regarded as the outstanding amateur of the time; when the Navy requested that Schnell be given a leave of absence from his job the ARRL agreed. He was commissioned a lieutenant in the Navy. He built and installed a modern transmitter and receiver aboard the flagship *USS Seattle*, under the call NRRL.

Fred said that he had sent his baggage ahead, and when he walked up the gang plank he was carrying just two suitcases. They immediately asked him where the equipment was. Fred said, "Right here in these suitcases." "Well," he said later, "I thought they were going to throw me off the ship right there."

The old Navy spark gear occupied a large room, and on some of the smaller ships it was necessary to shut down the propulsion to provide power for the transmitter.

Throughout the voyage, long after the long wave sets had faltered, the amateur short wave contact continued unfailing and reliable. All Fred had to do was announce his presence on the air and a hundred stations would answer. On more than one occasion Fred merely pressed his key, and without announcing his identity — so distinctive was the NRRL signal — he logged two to five stations calling in reply.

Fred kept his promise that he could "keep the *Seattle* in contact with Washington throughout the entire cruise." By the time they reached Hawaii the officers were completely enamoured with the "Short Wave" and loaded him with Naval and personal messages.

While in the harbor in Sydney, Australia, the captain brought aboard the British Navy officer assigned to Australia. On their tour of the ship they stopped to see Fred, and the captain described the fabulous performance of the tiny gear.

He further stated that Fred could probably talk to London at that moment. The Britisher didn't believe it, and said, "Well, let's see him do it." Fred pointed out that they were in territorial waters and that they had no authority to emit signals there. Whereupon the Britisher said, "Ha! I knew there was a catch to it. Go ahead and transmit. Probably no one will hear you anyway, and if they do I can take care of it." Fred said, "Who would you like to send the message to?" "To my wife, and ask her to cable me collect as soon as she gets it." Fred later told how the contrite officer appeared a couple of hours later with the message in his

hand, collect for $36.

Thus the era of spark transmitters ended for the Navy, and their move started a continuous wave.

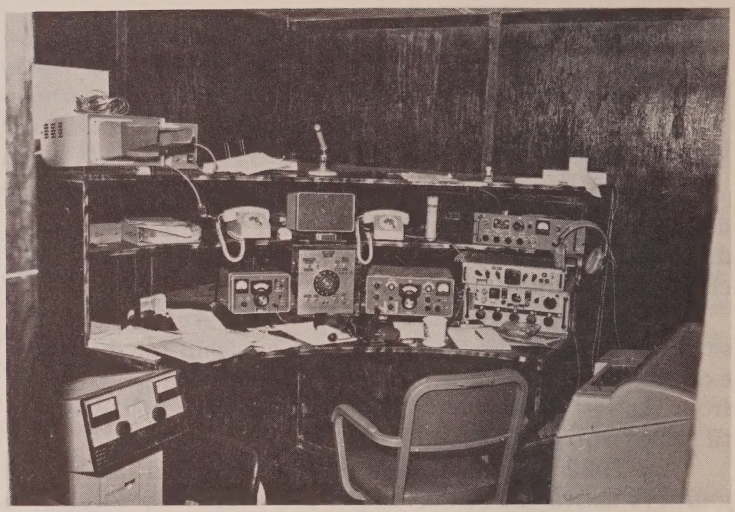
Polar Exploration

No chronicle of the early days of hamming would be complete without the story of amateur radio's role in expeditions and explorations. The few tales that follow were chosen from hundreds of examples.

Neither ice, nor snow, nor the long Arctic night, nor sub-zero temperature is the greatest hardship for the Arctic explorer. It is loneliness and the realization that he is cut off from the rest of the world for a year or more that gives him the chief worry and discouragement.

By 1923 Captain Donald B. MacMillan had made eight journeys above the Arctic circle, and there was nothing he feared more than isolation. His words were, "It has spelled disaster for many an expedition." On his 1922 trip he had carried a radio receiver, listened to broadcasting, to amateurs, and to government and commercial stations. But he found this

Watson Escarpment west of Leverett Glacier viewed from Mt. Webster. Official U.S. Navy photo by Greta Heintz.



MARS Station NNNØICE at McMurdo. Official U.S. Navy photo by Howard Weinger.

far from adequate. Two-way communication was essential. He asked many radio people about such communication. They were all agreed that there was but one body that could do the job — amateur radio. In the spring of 1923, MacMillan went to Hartford to interview Hiram Percy Maxim on the subject. An agreement was worked out. When the expedition sailed from Wiscasset, Maine, on the auxiliary cruiser *Bowdoin* in June, aboard were a complete 200m amateur station donated by the Zenith Radio Corporation and an amateur operator, Donald H. Mix, 1TS, provided by the ARRL.

Besides standing his watch as a member of the seven-man crew, Mix, through the months that followed, was required to transmit a weekly 500-word message to the North American Newspaper Alliance, to handle expedition traffic through amateurs, to stand regular watches for press, and to send back lists of amateur calls heard.

Two months later, after the expedition had finally succeeded in crossing Baffin Bay to Cabe Sabine in order to erect a National Geographic Society bronze memorial to the ill-fated Greeley Expedition, WNP — "Wireless North Pole" —

established a new world's DX record. Communication through summer static was spotty but with autumn came reliability. The radio installation on the *Bowdoin* was a great blessing. It annihilated isolation, brought entertainment and news of the world. Amateur stations generally handled outgoing business messages and news reports with the speed and reliability of a wire-line connection. President Coolidge filed a message of Christmas greetings to the party, which by then was frozen in for the winter in the harbor at Etah, Greenland. Despite many factors — the 200m wavelength, the aurora borealis, the summer atmospherics — communication was carried on steadily and with fair reliability until the *Bowdoin's* homecoming on September 20, 1924. The return, for Mix, was to an entirely new radio world, for by then shortwaves had been discovered, transoceanic communication was commonplace, and WNP on 200m was obsolete. Yet he had established a record that will endure in history. Such was WNP's success that "No polar expedition will attempt to go North again without radio equipment," predicted Captain MacMillan.

Fulfillment of this prediction was literal. On its 1924 trip the CGS *Arctic*, harbinger of civilization to the desolate eastern shore of Newfoundland and Canada, carried amateur shortwave equipment. Other expeditions, and exploring and cruising parties followed suit.

MARS

In August 1925, the Army linked up with amateur radio through the formation of the Army-Amateur Radio System.

In contrast to the U.S. Naval Reserve, joining the AARS did not necessitate enlisting in the military. The certificates of appointment merely conveyed the authority to handle the type of traffic involved. There was no compulsary organization. The purposes of the system were: to provide lines of communication in times of domestic emergency; to open communications channels for civilians in the armed forces; to establish contact with a considerable number of radio operators, thereby popularizing the Signal Corps and its activities; to generate a reservoir of trained operators.

This was the beginning of what is today known as MARS. MARS (Military Affiliate Radio Station) is an operation conducted by the Navy, Army and Air Force in which

licensed amateur radio stations and operators voluntarily participate in local or international communications as an adjunct to normal armed forces communications. It was originally known as Military Amateur Radio System. In spite of the loss of the word "amateur," it is still an amateur organization, although it has a military style.

All the services realized the great potential to be gained by association with amateur radio, and assumed a policy of encouragement and support. World War II saw more than 25,000 radio amateurs join the armed forces, and many thousands more assist in industry and war research work.

Amateur radio was called to aid in providing communications for the Dole Air Races between California and Hawaii in the summer of 1927, and did an excellent job. But the most memorable experience of those days was the tragic disappearance of *Miss Doran* and the *Golden Eagle*, and the gallant but ultimately fatal search for the missing planes made by Captain William Erwin and Alvin Eichwaldt in the *Dallas Spirit.* Those amateur operators who followed the progress of the plane by means of Eichwaldt's shortwave transmissions from the time the plucky duo hopped off across the Pacific until the signals died in a watery grave, will never forget the drama and tragedy of that night.

For hours the signals came through steadily, growing even stronger as the distance increased. Half an hour before the final crash they became unsteady, the frequency rising and falling at intervals, telling the story of bad weather conditions and uneven speed. Eichwaldt stuck to his post until the end — throughout the first nearly fatal tail spin — sending calmly and slowly up to the instant the ship crashed in the final spin. With the note rising to a shrill shriek and falling to almost zero (denoting violent movement of the ship) the dots and dashes came through like clockwork until they audibly sputtered out as the antenna hit the water. Knowing that he was heading toward his death, yet sticking to his key telling the world what was happening up to the last moment, Alvin Eichwaldt showed courage of the highest order and preserved the finest traditions of the radio operating fraternity.

Antarctica

The first Byrd Antarctic Expedition sailed in the sum-

mer of 1928. Commander Byrd had learned the value of amateur radio on his previous Arctic trips. For this new venture, preparations were even more extensive. Five people, three of them amateurs, operated the numerous transmitters for which eight licenses had been issued and six frequencies assigned. Later they were joined by another amateur, a New Zealander. Immediately on departing from America schedules were instituted with operators from the SS *Eleanor Bolling*, WFAT, and the SS *City of New York*, WFBT. The radio equipment reached the ice base in January 1929. The three huge masts supporting the antennas were raised. Almost at once Little America was heard around the world! All through the long winter night that followed, past the time of the momentous Polar flight that climaxed the two-year struggle, they were in regular communication with the outside world. Contact was sure, speedy, and reliable. More than two million words were handled by the expedition, a great part of it channelled through amateurs.

Even on the final lap of the undertaking, when the *City of New York* left Dunedin, New Zealand homeward bound on April 1, 1930, contact with civilization was unfailing.

"The greatest achievement of recent months was the constant radio communication with the Byrd Expedition and the part played by amateurs. Time and time again these youngsters of the American Radio Relay League kept in touch with Byrd when the big fellows lost him. It was the amateur who really discovered the value of shortwave radio." Thus, Dr. Lee deForest, preeminent radioman and inventor of the vacuum tube, paid homage to radio amateurs.

It was all a gloriously triumphant performance. The great event engendered an intriguing by-product. The editor of *The New York Times*, which had the exclusive rights to the news from the Byrd expedition, went home to listen to the radio signals being sent from the Antarctic. In order to listen undisturbed, he took his phone off the hook. However, an urgent situation demanded that his office get in touch with him. The line was busy, of course, and for a time there was no way to reach him. However, the operator at the *Times* office was told to insert a message in his traffic to the Little America station, asking the editor to call his office. He did. This little incident made news headlines everywhere, as the longest and fastest distant message ever: to the Antarctic and

back in a few minutes.

Some years later a very unusual Antarctic story emerged. Two flyers, whose names I cannot remember, were on a non-stop trip from New Zealand to London. They passed over the Antarctic continent and saw the towers of Little America's station (which incidentally endure to this day). A few hours later the flyers had engine trouble and were faced with the necessity of an emergency landing. To have landed on the cold, windswept ice of the Antarctic with no adequate shelter would have been extremely hazardous. However, they remembered the towers, and decided that there might be shelter there. They retraced their route, and sighted the towers. When they landed, they found that Admiral Byrd's installation was still intact. They stayed there until rescuers found them. I have color slides of the Byrd cabin under the snow, and there are still cans of beans and hardtack there. The size of the shelter was tiny compared to the vastly better facilities for the Antarctic crews now. Each year men are taken to the old Byrd station from the new Byrd station to see what it used to be like.

Clyde De Vinna

When Metro-Goldwyn-Mayer sent a picture troupe to Africa in 1929 to film *Trader Horn*, an epic of the jungle and veldt, they sent along as chief cinematographer Clyde De Vinna, winner of the Motion Picture Academy's award (Oscar) for his work on *White Shadows of the South Seas*, and an ardent radio amateur. De Vinna, in true amateur fashion took along a portable ham station, and under the call FK6CR maintained the party's constant business and social communication with faraway Hollywood throughout the trip.

The winter of 1932–33 found De Vinna, W6OJ, again in remote territory with an M-G-M motion picture expedition, operating an amateur station during the filming of *Eskimo*. K7UT was located in a little hut offshore from the frozen-in supply steamer *Nanuk* near Teller, Alaska.

It was in this little hut that De Vinna's life was saved by amateur radio. While working a New Zealand amateur one cold night he was overcome by carbon monoxide fumes from the gasoline stove in the shack. Sensing that something was

wrong when the signals from faraway Alaska faltered and then died out, the New Zealander, J. L. McLauglin, a lonely lighthouse keeper, called another Alaska amateur and soon a relief party was dispatched from Teller. It arrived just in time to save the unconscious De Vinna from certain death.

I was in Chicago working at Radio Station KYW at this time, and held license W9KRI. This story about Clyde De Vinna was widely told among amateurs; it was thrilling to know that such a long range rescue was possible. It made us proud to be amateur radio operators.

WHIO

While I was at KYW I had a little closet in my apartment containing a single 26 tube with about 180 volts on the plate. I had an antenna on top of the building.

In 1934 KYW moved to Philadelphia without relocating any of its employees. I applied for a job at WBBM, and was told "they would let me know." Since I hadn't much hope I went back to Dayton. I later learned that they had called me, but when they found I had left they hired another KYW employee instead. But for that slight instance of impatience I might still be operating under W9KRI in Chicago. It shows how a small thing can change your life.

After working at unimportant jobs for a while, I applied for a job at WHIO. At that time they were looking for people to start up their new radio station. I was assistant chief engineer there for eight-and-a-half years. But I didn't really like engineering, and wanted to get into production. I decided that what I really wanted was to work in the film business. I knew that I would have to make the move as an engineer, but I figured I could switch to production after I had become established.

In 1943 I left Radio Station WHIO to work in Wright Field's motion picture section as a sound recorder. After a few months I was able to get a transfer to the editorial branch, where I became chief in three months. From there I had a comprehensive view of the entire war.

We received combat film from both the European and Japanese fronts, and I was able to see Japanese training films as well as combat footage. I also received top secret films of fabulous new weapons. All are declassified now, but at that

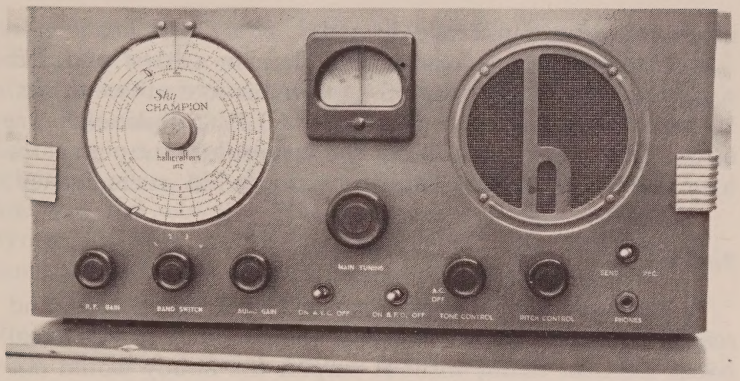
time I found that the general public's knowledge lagged about three years behind developments.

I had the job of supervising the editing and sound track recording of many films, and sent a condensed version each month to all overseas theaters to keep the commanders informed of the products of current research. I made the first film on the G-suit, the device that protected pilots against blackouts in steep dives. I condensed the footage for a film called *DZ Normandy* (*Drop Zone Normandy*) which showed the use of electronic beacons placed by advance parachutists. The beams activated incoming planes' and glider's radar screens to outline landing strips in enemy territory.

I made films on the television glide bombs used for blowing up tunnels and for mass bombing. I had the fascinating opportunity to hear stories of the use of our devices directly from pilots returning from overseas. One told me about the first glide bomb drop over Cologne, Germany. The flight was oriented with the control plane in the center of the flight, and this pilot signalled the release of the entire bomb pattern one hundred miles out from Cologne. As the flight turned toward home he viewed the city through the TV camera in the nose of his bomb and guided it over the center of the target area. He said it was a great thrill to realize that he and his planes were out of range of anti-aircraft fire when the bombs hit their targets.

The tunnel in the Brenner Pass was closed in Italy by cutting off the German troop trains with the same type of guided explosives. These bombs could be directed to exact hits on bridges and railroads in the same way. This was a new use for radio: a vast sophistication of model airplane remote control.

One of the most fascinating plans involving highly engineered radio control was the case of the "Java Man." This was the code name for an operation in which a PT boat, disguised as a Pacific fishing vessel, was under constant radio observation and control from a highflying B-17. Each PT boat was committed to the destruction of a specified Japanese cruiser, and the cruiser was located by the plane above. When the target was located, the innocent looking fishing boat would slowly stalk it, and suddenly head directly for the cruiser at full power under the control of the high flying plane, with zig zag pattern to avoid hits. It would crash



Hallicrafters: State of the art.

at full speed into the cruiser, and explode a shell in the nose.

The Japanese commander would be greatly relieved, as the perhaps two feet of steel shielding the cruiser would be very lightly damaged. However, as the PT boat sank, a 2000 pound depth charge hidden in the hull would explode at a depth of twenty feet. One film showed the cruiser being blown in half.

During these years we were not permitted to use ham radio, but as you can see my radio education continued.

I supervised the production of over seven-hundred films during my two years at Wright Field, and found what it was like to produce films without worrying about cost. One instance will show what I mean. I had a sound track of the Air Force song "Into the Wild Blue Yonder," but I didn't like the pace for opening music. I telephoned Hal Roach Studios and had them make a new version of the song with the forty-five piece studio orchestra. They shipped it back in a non-stop A-26 fighter flight. I tried it, but didn't like it as well as what I had, so I didn't use it. Though this disregard for cost may seem irresponsible, it is symptomatic of a pervasive damn-the-price that, in my opinion, won the war.

A project engineer was given the spcifications for an item to be designed and built, and a date when it would be used. He was issued a blank check to have any factory or engineer build it, but only on the condition that it be delivered on the required date. I know of some projects that seemed

impossible, but they were delivered.

After the war I read that a German general said, "It simply wasn't fair" for the USA to be able to do these things. He was referring to the production of 125,000 planes — one of the "impossibilities." This is the same spirit that permeates ham radio, and enables hams to "make do" in an emergency.

Post War

After World War II amateur radio was reactivated, and reaped a great bonanza — surplus equipment. This was a real boost for ham radio; without surplus the hobby would not have made such a spectacular comeback. Surplus gear put many hams on the air with little cost. Command transmitters were selling for two or three dollars. They were capable of running one-hundred or one-hundred and fifty watts of CW. They had very stable VFO's. BC 696's covering the 75m and 80m bands were used as foundation units for transmitting stations. The VFO's were excellent pieces of equipment, stable and very well calibrated. Thus for a few dollars, a small time investment, and a power supply, a ham could acquire a worthwhile CW unit.

The BC 342, a military receiver that covered from 1.5 to 30 MHz, made it possible for newcomers who might not otherwise have made it, to get on the air. These receivers sold for $35 to $50. Surplus tubes were everywhere. Transmitting tubes were 25 cents. The big ones were $1, $1.50, $2 for 250TH's, the tube used in the monster BC 610 transmitter. It was capable of about 500 Watts of high level plate modulated AM. The little BC 696 usually wound up as a driver unit for the BC 610. This produced a very powerful unit for a very small price.

Two other products made it on the scene about 1948 — television sets and a new ham product, the TVI filter. Another innovation was the novice program, started in 1950. It proved to be very important to ham radio. The novice license was a big help in getting non-technical people into the hobby. Many would never have made it without this program.

After that, through the fifties, there were two other significant developments. In 1952, on May 1, the new 15m band was opened up. About the same time, the new 40m

phone band was added. Forty meters had been a CW-only band; now phone was permitted from 7.2 to 7.3 MHz. Most of the phone operation at that time was AM. There was very, very little single sideband operation. You might occasionally hear one or two sideband stations, either talking to each other or to an AM station. Foreign broadcast stations were few and far between. The band was crowded with heterodynes, not from the foreign stations, but from AM ham stations, and to hear a single sideband station was a rarity.

QST in those days had a special SSB column called "On the Air with Single Sideband." It was a single column on the page. It gave calls, locations and schedules of sideband stations — that is how few there were.

In the middle fifties single sideband began to catch on. That was when Central Electronics made available their 10A single sideband exciter, a phasing unit. The higher power version, 20 Watts, was the 20A. It was band switching, while the 10A had plug-in coils. In the later fifties the KWM-1 became available; the KWM-2 came out in 1959. The KWM-2 was the first all-band, 80 through 10, single sideband transceiver.

The AMers didn't want anything to do with single sideband. They didn't understand it, didn't know how to tune it, and their receivers couldn't hold a sideband signal solidly. Some of the AM crowd mounted campaigns against SSB. The single sideband stations tended to congregate at the edge of the band — first the lower and later the upper edge. The SSB operators were technically more competent and knew how to work close without moving out of the band. The AMers were afraid to work close, and in general left the band edges free. Gradually, as their numbers increased, SSBers moved in toward the center of the band.

In the beginning of the Fifties the amateurs were largely broadcast engineers and radio technicians or repairmen. There were teachers, businessmen and others, but the greatest number were radio people. Today we have many more types of people involved in ham radio.

The early transmitters were crystal controlled on one or two frequencies, and when their operators called "CQ" they would add that they were "standing by and tuning." They would then attempt to find an answering station up or down the band. Today everything has changed; usually a station is listening on the same frequency on which it transmits. You

still hear a few old timers, though say "standing by and tuning."

Single sideband received a great shot in the arm from General Curtis LeMay, who helped make it the government standard. The decline of the parts stores was another result of single sideband. Amateurs in general could not build the new single sideband equipment, although W2EWL published a circuit for converting a command transmitter into a crystal filter single sideband exciter. That helped some hams convert without too much expense. Electronic keyers were another development in amateur equipment. Now even novices can buy a keyer with their first transceiver.

The sixties were marked by three new features — the new Technician and Conditional licenses, and the much debated incentive licensing.

In the seventies the Japanese began to take over the amateur radio market with very sophisticated moderately priced gear, and many U.S. companies began to fade away. National, Hammerlund and Hallicrafters gave way to this competition. Collins survived because of their hold on government and military markets, their superb reliability, and their automatic familiarity to thousands of electronic technicians trained with this equipment in the services.

Byrd Station

In 1964 I was talking with a station in Houston, Texas, and as he was signing off, I heard a weak "Break." I asked who the breaker was and heard, "This is KC4USB Byrd Station in Antarctica." I turned my antennas to the south, and replied. His signal now was quite good. He said, "We have been listening to you for about two weeks and you are one of four stations in the States with a consistently strong signal down here. We wonder if you would be willing to run traffic for us?"

I was elated that my signals were strong on 40m, nearly 10,000 miles away. I had by now changed over from telegraphy to telephony and this was one of my early phone contacts. They mostly wanted to run phone patches, but until I could obtain the equipment for that service I handled straight messages, by radio from Antarctica and then by air mail to the destination.

My very first message was a recipe for sugar cookies. Ross Smith, the antenna expert for the Antarctic at that time, asked if I would phone his mother in Michigan and ask for the recipe. Bob Smart, the cook at Eights Station, had agreed to make them for him. His mother was thrilled to hear from Ross and gave me the recipe. The static was bad that night, and we spent about half an hour getting the recipe through, but I didn't mind — I was hooked on Antarctica.

During the next fourteen years, I was to spend three to five hours a night with the Antarctic making over ten thousand contacts with a total of twenty-one stations; these were either on the ice continent, in supply ships, or in ice breakers en route.

Later, I will tell my Antarctic encounters more fully, and will tell more about the Antarctic continent; but first I would like to recount some experiences, some that I lived through and some told to me by others, in emergency relief operations.

2

Radios to the Rescue

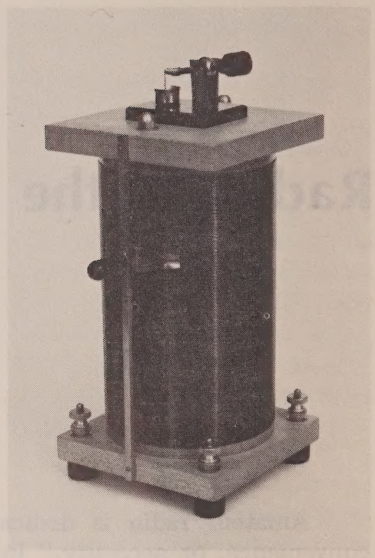
Amateur radio is dedicated to the "public interest, convenience, or necessity." In no way is this public service requirement more adequately fulfilled than by the amateurs' way of stepping into the breach when earthquake and flood, hurricane and fire have wreaked havoc and left communication gaps which can be filled by no other means. Amateur radio has been the principal, if not the only, communications link following more than a hundred major and many more minor disasters.

We cannot recount all the disasters in which amateur radio lent a helping hand, so we will relate only a few of the more significant stories.

1922 Blizzards

In late February 1922, an icestorm and blizzard completely isolated Minneapolis and St. Paul, leaving the Twin Cities cutoff from the outside world. The University of Minnesota's amateur stations, 9XL, together with 9JT and 9AJP, established communication with amateurs in Indianapolis, Chicago and other points, and handled press and official emergency traffic continuously for forty hours.

On November 4, 1922, a snowstorm covered Wyoming and Colorado to a depth of fifteen feet. Two trains of the C. & S. railroad were blocked in the storm. As the hours went by, the engulfing whiteness swirled higher and higher,



Early crystal set—1916. Photo courtesy W1HR.

and escape seemed more remote to the shivering occupants of the frigid coaches. The Union Pacific was also tied up. Norman R. Hood 7ZO, of Casper, Wyoming, handled relief traffic for both systems, effected relief of the marooned trains, and dealt with the press as well. He worked for nearly forty hours with amateur stations in Denver and Kansas City. His efforts saved several trains with their crews, passengers and live cargo.

1924 Blizzard

Half of the United States turned to amateur radio for help in early 1924. From February 3-5, a blizzard had swept over the northern half of the country, accompanied by the worst sleetstorm of many years. All wires, it seemed, were down. Communications in the midwest were at a standstill. Many large cities were isolated. Hundreds of amateur stations became active as the need developed, handling messages for the railroads, press, officials and individuals; numerous lives and much valuable property were saved. In Chicago, 9AAW was accorded permisson by the radio inspector to adopt a twenty-four hour schedule that disregarded quiet hours. In

Minneapolis 9ZT-9XAX acted as a radio Paul Revere, calling amateur minutemen into action; they kept a continuous watch in the Twin Cities. In Des Moines 9BRS took a message from a disabled mail plane, then handled the 1500 words of press copy that gave California its first news of the arrangements for the Wilson funeral. Many incidents of interest and importance were reported. Medical aid was summoned from Dana, Illinois, for Streator; nurses and laymen received emergency instruction from doctors over the air; a North Dakota woman had just had a serious operation in a Chicago hospital but her husband could not learn the outcome until amateur radio found out for him. All press information concerning the Milford, Minnesota mines disaster went via amateur radio; the Pennsylvania Railroad, the Chicago, Milwaukee and St. Paul, and the C.B.&Q. and other railroads lacking wire service utilized amateur aid.

Said *QST*, "From the above it may be seen that many stations did fine work. There were many failures, however, and we are in no position to pat ourselves on the back insofar as net results are concerned. Not enough stations were on the job . . ."

A remedy for this lack was conscientiously sought. In October 1923, the ARRL had considered plans for organizing a railroad emergency committee. The February blizzard gave added impetus to the plan and test drills over the Pennsylvania Railroad were begun. A network of eighty stations, organized by A. L. Budlong, had been recruited for the work.

This network functioned for the first time on May 17-18, 1924, when forty-five out of fifty test messages were correctly delivered from four regional headquarters to the main division points. In later tests this became a monotonously regular 100%. A heroic record of actual emergency work was made during the winters of 1924-1926.

In early 1925, official pronouncement of the adoption of "QRR" as the amateur distress signal and emergency signal, or "land SOS" was made by the ARRL. This was an adaption, to conform with the list of "Q" signals, of the call "PRR" used on the Pennsylvania Railroad net.

Amateur radio played an important part in getting the news to a breathless public during those tense days when the entire nation was watching the gallant fight made in Kentucky to rescue Floyd Collins, entombed in Sand Cave.

This spot was some miles from Cave City, Kentucky, the nearest telegraph point, and it fell upon a group of amateurs to provide communication for the miliatry, the civil authorities, and the press. Their efficiency was such that they handled information almost instantaneously. During the climax of the Sand Cave developments two amateurs, 9BRK and 9CHG, maintained a continuous watch for four days without sleep — a devotion to duty unequalled by any of the rescue group.

1926 Hurricane

The Florida hurricane of 1926 wrecked Miami, Pensacola and other cities. 4KJ and 4HC sent a message to the governor of Florida asking for aid and outlining the most pressing needs. During the several days before wire service was resumed, these and dozens of other stations stayed constantly on watch handling hundreds of messages and many words of press copy. In Tampa a group of amateurs borrowed a motor truck, equipped it with some of their homemade apparatus, drove to the devastated area below Tampa, and put this improvised station on the air to call for aid.

1927 Flood

One of amateur radio's most noteworthy opportunities for emergency service was the terrible Mississippi flood of 1927. Areas in Arkansas, Mississippi and Louisiana were flooded for many days. The first news of the inundation was transmitted to the outside world by 5SW. With 5ABI, 5QJ, 5UK and a number of other amateurs, this station handled traffic for the military, the Coast Guard, the Red Cross, the press, officials, and other individuals for a period of three days. An appalling toll of death and damage was exacted by this flood, but the tragedy would have been even more extensive had it not been for the aid of the numerous radio amateurs who participated in the emergency work.

1927 Flood — New England

Large areas of New England were inundated by a flood caused by a tropical storm that swept the entire Atlantic coast on November 4, 1927. Virtual isolation of a large part of the region resulted. Many thousands of messages of all

descriptions were handled by dozens of stations in the stricken states. This disaster rivalled in its magnitude the effects of the great snow and sleet storm of 1924; this time the amateur communications facilities employed were so widespread and their use so prolonged that the ham network constituted a literal mobilization of the emergency reserves of the New England states.

1928 Hurricane

Unlike the Florida hurricane of 1926, the one in 1928 found amateurs forewarned and mobilized. Yet such was the ferocity of the storm that again all communications, including amateur radio, were wiped out. When it became evident that trouble was brewing, two amateurs, Forrest Dana, a young civil engineer, and Ralph Hollis, a fireman, started at 1:30 a.m. to equip an emergency station. When the hurricane came it carried away the building in which the station was housed. Undaunted, during the worst of the storm, these two amateurs started all over again. This time they found a place where their antenna would remain standing. Using a station that had been erected under the most unfavorable of conditions, they carried on without a break from Monday until Thursday, handling all incoming and outgoing communications for West Palm Beach. All the Army's and the Red Cross' work was based on information from 4AFC. For this effort they received the highest commendation from officials of these and other organizations, from the Chief Signal Officer of the Army on down. Meanwhile, their homes and all their property had been washed away.

1931 — Newfoundland

Varick Frissell's ill-fated sound movie expedition ended not with celluloid Eskimos flickering on a silver screen, but in the halls of Valhalla when the schooner *Viking* exploded off Horse Island, near Newfoundland, on March 15, 1931. Several members of the party were killed, and many wounded. Amateur radio played one of its most romantic roles, cued at the beginning by a mysterious girl operator on Horse Island. She transmitted all the press information on the tragedy (against, it must be said, the wishes of the Newfoundland government), and handled weather reports for Bernt

Balchen's rescue flight. The press and fliers, if not the government, all were "most profuse in their thanks."

1931 — New Zealand

Tragedy swept New Zealand on Feburary 23, 1931, when two of its most prosperous towns, Napier and Hastings, were overwhelmed by earthquake and fire. More than 350 residents were killed and thousands injured by collapsing buildings. All telephone and telegraph wires were destroyed and communication with the outside world was completely cut off.

In his office in Hastings when the first wrecking blow fell, C. E. Tyler, ZL2BE, escaped through falling walls and buildings and by the merest chance reached home. He found his equipment completely wrecked. Rushing back to town, he recovered some batteries from a ruined radio shop and with apparatus salvaged from his station soon assembled a workable transmitter. Making contact with Gisborne, Tyler gave news of the disaster and made an urgent appeal for doctors, nurses and medical supplies. These were rushed by airplane to the stricken towns.

In Napier, ZL2GE did yeoman service. He managed to recover a few "B" batteries from one of the radio stores before fire destroyed it, and with these under his arm, bolted for home. Here he reconstructed his transmitter and soon made contact with Christchurch and Wellington. His station and those of other amateurs were taken over by the Post and Telegraph authorities for the handling of official traffic with the amateur operators remaining in charge. Throughout New Zealand amateurs stood by; many stations rendered vital assistance in handling all varieties of traffic. The work they performed was, as always, a bright spot in the gloom of disaster.

1932 — California

One of the fiercest and most tragic storms in the history of California erupted on September 30, 1932, loosing its fury in the high Sierras sixty miles southeast of Bakersfield and washing down through the old mountain mining town of Tehachapi, through Tehachapi Pass, down Caliente Creek and Canyon. A forty-five foot wall of water wiped out six vil-

lages, crushed houses like matchboxes, and killed countless people, handled two monster locomotives and their trailing boxcars like toys, burying one out of sight in the silt of the creek bed. It left a ghastly path of death twenty miles long, and an aftermath of millions of dollars in damage.

Rising to the emergency, Bakersfield amateurs organized an expedition led by the California Highway Patrol to bring emergency relief to the stricken area. Five amateurs at the site and another half-dozen on watch down in the valley conducted emergency relief communications for a day and a night until the work of rescue and restoration was essentially completed.

1933 — California

The terrible California earthquake of March 10, 1933, found dozens of amateur stations in the earthquake area and hundreds outside of it on continuous watch for one to three days, cooperating with relief agencies operating within the zone and handling almost all existing communications rapidly and efficiently.

Ten minutes after the first giant retching shudder in Long Beach Al Martin, Jr., W6BYF, was on the air, telling the world about the disaster. Through the night other amateurs emerged painfully from the wreckage, salvaged tubes and parts and power supply facilities, put them together and somehow got back on the air. Six hours elapsed before any vestige of wire line service was through to Long Beach, center of the stricken area. It was four hours before the local broadcasting station regained power, the roof having fallen in on its dynamo room. During this time amateur radio was the sole means of announcement and communication. During the following week, when wire lines could not handle any appreciable percentage of the piled-up traffic, amateurs stepped to the fore as a communications system second to none in usefulness and efficiency.

1936 Flood

Beyond all doubt, the greatest public service performance in amateur history up to this time was that effected during the Great Flood of March 1936.

I was assistant chief engineer at radio station WHIO,

having come to Dayton when KYW in Chicago moved to Philadelphia in 1935. We had a small mobile transmitter which was designed to feed programs to the station from remote areas. It got its first real test in this flood.

Throughout the eastern United States in mid-March streams of spring waters augmented by hard rains rose almost overnight to flood tide. Lakes and rivers bulged with the input from steady downpours, melting snows and thawing river ice cakes. As the crisis became apparent, amateurs warned by ARRL broadcasts of possible early March flood danger, were on the job. At 4:00 p.m. on Tuesday, March 17, communications were cut off at Johnstown, Pennsylvania. Amateur radio took over. As the danger spread from area to area the amateur emergency communications system expanded flexibly and spontaneously. From Johnstown, along the Conemaugh River, to Pittsburgh, down below on the Ohio, eastward on the Susquehanna and its tributaries, southward on the Potomac, right up to the nation's capital, then throughout the New England states, the amateur networks sprang into existence unrehearsed but effective. To a certain extent they were based on existing systems — the Army and Navy Reserve networks, the ARRL Emergency Corps — but many came into being on an entirely impromptu basis.

In Pennsylvania one amateur became the focal point for nearly one hundred stations in the 3900–4000 kHz radiotelephone sub-band through mutual and practically unspoken agreement. Much the same thing happened in other places — along the Merrimac, in New Hampshire; in the metropolitan Hartford district, where voluntary emergency organization reached a high point of development; in various networks organized for public utilities, notably that for the Connecticut Valley Power Exchange. The amateur airlanes of the East were virtually clear of all except flood traffic; emergency stations jammed all channels.

It is estimated that at the peak of activity a thousand amateur stations were engaged in emergency work. Since I was occupied with the broadcast station I had no time to get on the amateur bands to help.

At WHIO radio the entire staff was engaged in emergency communication. The station was used as a transmitter of information to people in the Ohio and Kentucky area. Many cities in the flood area were without telephone service.

We received messages about supplies from the Red Cross, and sent requests for supplies to Red Cross agencies to the north of us.

One transmission I remember was to the Coast Guard on the Ohio River in Kentucky to the effect that there were 3000 people huddled on roofs and in trees in Warsaw, Kentucky, and if they were not rescued soon they could all be drowned by the rising waters. We had no way of receiving acknowledgement of the receipt of the message, but the next day we were told that the message had been received and that the Coast Guard vessel had rescued all of the people.

The spouses of most of the staff were engaged in receiving and sorting for priority the telephone and radio messages. I worked around the clock, eating what food was brought to the station and grabbing bits of sleep now and then on cots and on the floor of our audition room.

After a couple of days it was decided to attempt a broadcast from the stricken area near Portsmouth, Ohio, from the various confluences of the Ohio and Scioto rivers. We had our mobile transmitter and receiver to hear the broadcast radio station. Five of us, including the assistant station manager, piled into a station wagon and headed southwest. As we came close to the area we began to run into places where the roads were blocked by high water, and had to stop for instructions from the people in the area as to how to get around the water-covered roads. In most cases, this meant following narrow country roads over and through the hills. Many of these roads did not appear on our map, so the progress was slow. When we finally got to Portsmouth we found that the Scioto river had completely divided the city; to get where we wanted to go we had to backtrack 52 miles through the hills because we couldn't cross the 20 feet or so of rushing water in Portsmouth.

We had tried to get through on the air with our mobile unit, but the distance was too great, and we decided to go to the telephone building for a line to Dayton. When we finally were able to reach the building, the telephone company at first refused a line on the grounds that only emergency traffic was permitted, and our broadcast did not qualify. Since there was no place to spend the night, we decided to head back to Dayton, and tried to lighten the load by sending some of the crew back on the train.

The last train was standing ready to leave and we had to make a quick decision. We let two men go on the train and three of us stayed with the mobile unit. At the last minute we were granted use of a line for a brief time, made our broadcast and left.

We did get out of the area, but at one point we had to squeeze through a space about six-feet wide between a mud slide and the river that edged the road. I was driving and I stepped on the gas and sailed through leaving the other two in the car speechless. The men working at the mud slide trying to clear it just stared and shook their heads. It was about five minutes before anyone spoke, and then the assistant manager at my side said, "Well, you sure can drive. I never thought we'd make it." We stopped in the small town of Jackson, and stayed the night. While we were sitting in the lobby the crew that had been working the mud slide came in.

"You guys were really lucky," one said. "We didn't think you would make it."

This was just one small incident in the flood. It makes one realize that the whole country was experiencing thousands of such incidents. There was perhaps a billion dollars in property damage, a half million persons homeless, hundreds of thousands destitute — yet the total loss of life was given at 214 souls. Undoubtedly the fundamental reason for this state of affairs was the effective emergency system that enabled prompt warning of the authorities, immediate evacuation of threatened areas and undelayed provision of relief and rescue aids.

In all of these emergencies — and many others of lesser importance not here recorded — amateur radio played a major role in the rescue work, and amateurs earned nationwide commendation for their resourcefulness and skill in effecting communication when all other means failed.

The MARS network is utilized frequently by the three armed services as a result of this recognition, and the Red Cross instructs its field workers to use general amateur radio for communications when disaster strikes.

At a conference on the subject held in Washington in 1934 in which an attempt was made to subordinate amateur activities to a centralized "coordinated" control, apparently for the purpose of establishing censorship regarding information transmitted from stricken zones, the record of the

American amateur in emergency work was presented. Amateur radio's opposition to the projected plan was supported by the military, and amateurs today remain free agents, authorized to act at their own discretion, using exactly the same competent methods they have employed in the past, which have resulted in the saving of innumerable lives and inestimable property.

If there is one thing which can be learned from these accounts of emergencies, it is that while each disaster has its own characteristics, and seldom can these be anticipated, there are two important constant factors: amateur radio is the only reliable method of communication, and this network works best when its organization is prepared in advance.

As you read on think of the little things which become staggering obstacles: power off, high winds, snow drifts, freezing rain, high water — but the greatest obstacle of all is lack of communications. Everything stops when communications fails. Panic takes over.

Amateur radio operators have always furnished the communications, and we hope, always will.

1969 Hurricane

Hurricane Camille was the worst hurricane in the history of the United States. August 17 and 18, 1969, were the dates; 258 people died in the storm. It hit the Louisiana and Mississippi shoreline and wiped out entire stretches of the coast around Gulfport. I have been through the area both before and after Camille, and the damage was unbelievable. Large hotels that had stood for years were reduced to rubble.

Gerry Murphy, K8YUJ, was stationed in the Navy near Gulfport when Camille hit. He strapped his mobile home down when he heard the warning, but his neighbor laughed, and said it was not necessary. Gerry's mobile home stood all the fury of the storm, afterwards he found that his only damage was a soaked carpet. His neighbor's mobile home had vanished.

Gerry was in a Volkswagen in the middle of the hurricane. The wind tore out his windshield, but he stood his ground and took messages from drenched victims who came up to the car, and relayed them to me on 40m. Two men helped take down the messages and passed them to him to

read to me. I handled about a hundred, including some to as far away as Vietnam. I telephoned the messages to Eunice Bernon, K8ONA, who put them on a traffic net in Cleveland. One message in particular I remember. It went to a service man in Vietnam, and read, "We are all OK but our house is gone. Love . . ."

During the night I had another task — to keep track of a truck filled with embalming fluid, on the way to the disaster area. It reported its location every hour or so, and I informed the authorities in Gulfport and Biloxi.

At night the Army clamped down and would allow no one in the area because of looting. Even the Navy personnel were afraid to venture into the zone at night.

Most useful during this emergency were portable 2m FM units rushed in by amateurs.

Hand-held Aids Capture

At approximately 9:00 p.m. John Ovenden, 14, knocked on Tom Burnett's (WA4ZET) door. John and his dad, Les, had discovered that the house next door had been broken into and vandalized. The owner and family had left for the summer and Les had agreed to look after the house and animals. Les mentioned that the house had also been entered the previous evening but that nothing had been visibly disturbed. They asked Tom for his assistance.

As the three discussed the situation, John remarked that he thought he had seen some people entering the woods across the street as he and his dad were walking to the house. The police were called. John then remarked that he thought he knew who might have committed the robbery. He and Tom, who took his 2m hand-held unit, went to the suspect's residence. He wasn't home, but before they started to leave, the suspected thief drove into the driveway with three companions — and the stolen articles in the back seat of the car. His "friends" ran.

WA4ZET used his hand-held rig to autopatch a message via WR4AAS (22/82) to the DeKalb County police who came and arrested the suspect and confiscated the evidence.

Amateurs Respond

When the skipper of the ketch *Spellbound* was killed in

an accident near Tahiti, amateur radio operators in Hawaii, California, Guam and on the high seas assisted in the rescue of the vessel in the best tradition of the hobby.

Loren Edwards, WB6SWT, skipper of the vessel which was bound from the Marquesas to Papeete, checked into the Pacific Martime Mobile Net daily at 0500 GMT. However, on February 24, at 1630 GMT an unfamiliar voice giving the international distress call, "Mayday, Mayday," came on the net frequency and was picked up by Roland Carpenter, WB6YID, of California. It was the skipper's son, Gary, saying that his father had been bludgeoned to death by the swinging boom of the vessel.

Conditions deteriorated and Hawaii's Henry Lee, KH6DE, and Edward Wright, KH6EW, together with other Pacific basin stations, became key units for message traffic during the next two days. By this time the vessel was lost and rendezvous with French Polynesian authorities who had been sent out was becoming more and more difficult.

Gary tried to shoot the sun to establish a fix but had trouble processing the data. William Whipple, KH6ILV, a retired airline pilot, fed the information into his computer while Commander Michael McLane, KH6IHZ, stood by to double check the calculations. It was established that Gary had given the French authorities a wrong position fix.

The *Spellbound* was now low on fuel, as evidenced by the weakening radio signals. In the course of the conversation, it was discovered that there was an auxillary fuel tank but Gary did not know how to switch tanks and restart the engine.

Earl Schenks, KH6HMM, William Whipple, KH6ILV, and Louis Valier, KH6HEY, who were familiar with the operation, gave advice. They were assisted by phone patch directly to the Detroit-Diesel representative in Honolulu.

Henry Lee, KH6DE, retired FAA communicator, gave Gary instructions on how to respond to searching aircraft.

Sea Rescue

Two Vancouver amateurs, Vic Waters, VE7ALR, and Gary Descates, VE7CGD, combined with FR7ZS on Reunion Island to help a seriously ill sailor on the French freighter *Onyx* in the Indian Ocean. The incident began on the morning of February 14, when Vic, a radio personality and a long-

time amateur, heard a call for help on 20m while listening on the ship's station, FNRE, manned by a former ON6, Alain.

Vic later reported, "He couldn't speak English very well and all I could make out was that help was needed for a very sick man on board."

Vic called neighbor Gerry, who was fluent in French, and he found that Alain, the ship's operator, had tried the normal marine frequencies but had been unable to raise anybody. He knew from his amateur experience that his chances of raising someone on the amateur bands were good, so he put in a call.

Vic and Gerry knew there was no active amateur in the Port of Moroni in the Comorros Islands, the ship's destination, but managed to raise FR7ZS on Reunion Island who knew the tower frequency at that port. He radioed the authorities there and they sent a fast launch to the assistance of the stricken crewman.

A couple of days later, Vic and Gerry heard from Harry Beardsell, VE7ZQ, the news from Noel, ON7FN, that the timely assistance via amateur radio led to the sailor's eventual recovery.

Australia Search

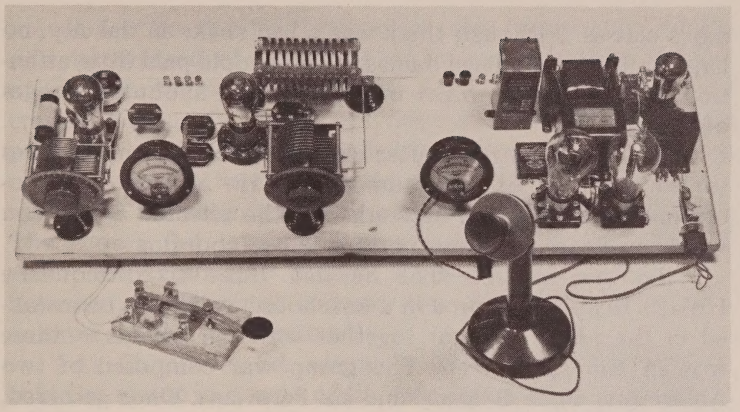
Reprinted from *Amateur Radio* — Australia

Licola, Victoria, fifteen schoolboys and two teachers missing for two days on Mt. Tamboritha, were rescued by helicopter.

Amateur radio operator Keith Scott, VK3SS, was the vital link between search headquarters and searchers. For seventeen hours on the chilly summit of the mountain, Keith operated his well-equipped mobile station.

A helicopter overhead and experienced bushmen on the ground searched the dense mountain timber for the missing people lost while on a school hike in the ranges.

Mobile 144 MHz transceivers with the searchers kept in touch with Keith to relay their messages to police, while anxious parents and friends crowded around the radio van to listen to the progress. They were delighted to hear that all had been found. They took for granted that the radio gear was part of the search headquarter's equipment. They were



1930 phone transmitter.

unaware that the cost of that vital link was borne by Keith in true amateur fashion.

Two Weeks in Hell

A lone bird wheeled lazily in the thin Peruvian air against the background of a pale sky. Down below, the mountains jostled in friendly combat. Brown valleys stitched to the hillsides were fertile with people, cattle and grain. In one city, a Corpus Christi procession joyously wound its way through the streets. God had tumbled the land, but it was a peaceful scene — a Sunday afternoon in June, 1970, a few hundred miles north of Lima, Peru.

Suddenly the mountains went into convulsions. Stretching north for a thousand miles they writhed and shrivelled in agony. Some terrible subterranean upheaval was taking place. It looked as though a giant were shaking the landscape like a rug. A chunk of earth ten miles long and two miles wide broke from the mountains. Landslide rubble began to choke the canyons and hanging valleys.

At Huarez, Brother Hillary, OA3T, was on the second floor of his house when it collapsed; he fell into the room below. He picked himself up, dug into the rubble, found his radio and used it to get news to the outside world.

In Lima, Ed Schmidt, an American Jesuit seminarian and also an amateur (OA4SS), was preparing for the next

day's classes. Although there was a bad shake in the city, no large buildings had been damaged and people paid little attention. But during the night word filtered in about the ravages of the quake.

The next morning after classes, Ed offered his services to the Ministry of Communications. He was asked to coordinate the telegraph network into the affected area. Then word came that there was nothing left to coordinate!

Ed remembered that he had three fixed-frequency HW-18 Heath rigs stored in a warehouse waiting to be installed in the jungle. He got together with ten friends — three women and seven men. The group was composed of two Americans, three Belgians and six Peruvians. Once gathered, they constructed antennas, assembled rigs, and listened to Ed's one-hour lesson on how to install and operate the radios. Only two were amateurs, Ed and Fr. Bob Gloisten.

After receiving permission, the group started into the interior at 1:00 a.m. Tuesday morning, not knowing when they would return. About 6:00 a.m. they struggled into the town of Casma. The city was wiped out, the new hospital a pile of rubble. After filing a radio report with headquarters at Lima, they pushed on to Chimbote, 250 miles north of Lima. They arrived at 11:00 a.m. to find that Chimbote had also been destroyed. They remained there for four days because there was no way to get into the interior. The canyon was choked with dust and the road along its top had slid off into the debris. Ed set up his HW-18 and a small generator in what had been the corner of a house and got word back to Lima.

On Saturday morning, the dust cloud in the valley began to clear and it was finally possible to go north. A helicopter equipped with radar for landing in such circumstances had arrived. Ed had brought along a Drake TR-4 and had used it to make contact with the States. He told his family he would be on the first helicopter to go into the interior. His job was to set up a radio station at the emergency airstrip that was to be carved out of a cow pasture at Anta.

At the last minute there was a change of plans and Fr. Bob went instead. Ed remained behind to make sure that all personnel and equipment made it out on the next flight. Then he waited anxiously by the radio to hear news of Bob's arrival.

A few hours later Bob's voice came over the air. He was safe, but instead of being in Anta he was nestled on the side of a mountainpeak at 14,000 feet. The helicopter had crashed because it could not negotiate the thin air of the pass. The machine bounced six times upon impact, breaking up as it went. The passengers had put their supplies in the middle of the cabin and were seated in a circle around them. The motor fell into the center without harming anyone. After the crash Bob looked around, found the rig, the antenna and generator and got two people to hold up the antenna while he transmitted!

At Chimbote, Ed, changing from Spanish to English, told the major in charge of the helicopters what had happened. The major replied that no one could survive such a crash.

A reporter outside the tent asked who the Father in the helicopter was and someone told him it was Ed Schmidt. That night his father in Ohio heard the news on TV, "U.S. helicopter crashed in the mountains in Peru . . . U.S. priest aboard."

Ed's superiors in Lima were trying to think of the best way to break the news to the family. Down the street the sisters in the convent were preparing to have a Mass said for the repose of his soul!

Meanwhile Fr. Bob and his group walked down part of the mountain to a clearing where they were picked up. That afternoon he was on the air directing traffic over the Anta cow pasture. Ed went into the interior the next morning.

For the next ten days, until they returned to Lima, Ed worked at Anta as bilingual coordinator for rescue operations. The plan was as follows. The team would be sent out in groups of two or three. Often one of the sisters would double as nurse and radio operator. They would shuttle into a place via helicopter, set up the radio, make a survey, give emergency medical treatment and call back to Ed with a report on what would be needed for supplies and evacuation.

Conditions were terrible. One team was sent to aid the city of Yungay, but the entire city had disappeared under a landslide. Thirty-thousand people had perished. Some children attending a circus on a hillside escaped by racing to the top of the hill. The job of the team was to evacuate the thirty-five orphans who were alive.

Air rescue operations were dangerous due to the alti-

tude. Four medium-sized choppers, one huge Chinook, and one fixed-wing aircraft were lost. Often parachutes bearing supplies would not open because of the rarified atmosphere. U.S. military pilots risked life and limb skirting canyon walls.

Ed tells a story which gives a picture of what was happening. One day he was doing air traffic control and handling Red Cross and other emergency communications all on the same frequency. He was stretched out on the floor of the tent to conserve energy, for each person had only one can of 'C' rations per day. A new helicopter pilot was arriving and on the air asked for a whole series of technical information in preparation for his landing.

Ed replied, "Helicopter, whatever your number was, this is Anta control tent. I just wet my finger and stuck it out through the flap. There is a breeze blowing. Now there are two C-123 flying boxcars, four helicopters and two fixed-wing aircrafts flying around up there. Please don't hit any of them when you come in. Can I help you with any other information?"

There was a pause, then came back from the pilot, "Naw, I guess not — I get the picture!"

Ed's reply was, "Good! Welcome aboard!"

The crew spent two weeks like this. Were it not for their radios and their skills many more would have died. As it was 70,000 people perished during this time.

Mother-Twins Saved

An amateur radio operator and a surgeon helped save a woman and her unborn twins in a remote jungle village two-thousand miles away — by relaying step-by-step instructions over the radio on how to perform a Caesarian section.

After picking up an emergency call from Al Touchette, WB6MID, a missionary stationed at a mission hospital in Guyana, the two men spent forty desperate minutes directing a mission station doctor in his first Caesarian operation. Dr. Albert Greenfield, an obstetrician from Potomac, Maryland, said, "I was nervous and I gathered from the intonation in the other doctor's voice that he was anxious. I'm just glad that the mother and her babies made it, but for a while it was very doubtful."

The drama began when Richard Hayman, K3DML, who

had just finished a contact with Japan, was turning the dial. Hayman said, "I guess it was just a question of being in the right place at the right time. I picked up a call for help — a call for an obstetrician — and I thought I could help because Dr. Greenfield is a friend and doesn't live far away.

"The problem was a complicated pregnancy and the doctor there could not move the woman because the nearest air strip was closed by fog."

Hayman contacted Dr. Greenfield and linked him via phone patch to the doctor in Guyana, the small former British colony on the northeastern coast of South America.

Dr. Greenfield said, "What made this case unusual was that the woman was two weeks overdue and had been in labor for more than fourteen hours. If nothing had been done, she could have died."

The doctor in Guyana, Dr. Larry Schacht, told Dr. Greenfield the mission's X-ray machine was broken and that the "hospital" had no blood bank and only the most primitive form of anesthetic.

Greenfield said, "I gave him very explicit directions, step-by-step, and since there was some doubt if the woman would return to the hospital if he let her go, I told him to keep her there for ten days and gave him detailed post-operative orders.

"I was over-simplifying things and I would say after each instruction, 'Do you follow me?,' and he would say either, 'Yes, go on to the next step,' or he would ask me to repeat what I had said. Occasionally there was some radio interference and he would not catch the complete instruction and we would do it all over again."

Dr. Greenfield explained that the same operation in an American hospital would involve five or six highly trained people using the latest equipment.

"We called back the next day and were told that all three were doing fine, even though the mother had lost two pints of blood," Dr. Greenfield said. "She had twin girls, one 6 pounds 4 ounces and the other 6 pounds 2 ounces. That's big for twins," he added.

Richard Hayman, who kept the radio link open for forty minutes, said, "It was amazing. I thought it was great that Dr. Greenfield was able to adapt to the equipment and the conditions Dr. Schacht had down there and to make

his explanation so detailed."

It was the second time Hayman had been involved in a medical emergency in South America. Five years ago he picked up a radio call from Quito, Ecuador, asking for special equipment to save a boy with a ruptured diaphragm. Hayman arranged to have it flown in within twenty-four hours.

Operation Rescue

As the Christian world was preparing to celebrate Christmas, tragedy hidden by darkness of night, broke the peace of the Republic of Nicaragua. The destructive force of earthquake tremors almost erased the capital city of Managua from the map.

A short time after the occurrence of the earthquake, Enrique Gabuardi, YN1EGL, made contact with Adrian Espinosa, YN1AEO/W4 of Miami, Florida, vice president of SIRA (Sociedad International de Radio Aficionados), on the 20m band. Enrique was operating mobile from his car, and was the first to inform the world of the terrible catastrophe. Adrian, in Miami, lost no time informing various other amateurs of SIRA, including the Society's president, Rafael M. Estevez, WA4ZZG/KP4DNI. Estevez, upon hearing the news, got on the air immediately to garner any information that might help in determining a relief action policy.

Estevez, after contacting Managua directly and taping the commentary of YN1EGL, contacted Antonio Arias, head of the news bureau of radio station WFAB in Miami. At the request of Arias, Estevez replayed the tape which he had recorded, allowing the radio station's listeners to hear the dramatic voice of Enrique asking for assistance and relating what he saw. The listeners heard that Managua had fallen to the ground; they heard the cries of the wounded and dying and of those who were being buried alive! And so it was that WFAB, through the help of SIRA, informed the Spanish-speaking community of Miami of the catastrophe which had occurred in Central America. The telephones of the radio station began to ring incessantly with demands for more information. However, at that time, there was no commercial communication within Nicaragua or between Nicaragua and the outside world.

By 7:15 a.m. of that fatal Saturday, December 23,

1972, the emergency net of SIRA had already been activated, with German Ordonez, HK3CJD/W4, acting net control on 14,220 kHz.

At the suggestion of Estevez, Espinosa and Ordonez went to WFAB to personally coordinate the emergency activites. Ordonez brought his mobile equipment in order to maintain communications with Managua, while Estevez and Espinosa were in constant telephone communication with other hams in Miami.

The radio station became swamped with calls from those wanting information about relatives, and the studio itself became crowded with concerned people requesting information. In order to calm the public, Estevez and Ordonez broadcast to listeners of WFAB that at the present time it was impossible to get more information from Managua, because the mobiles there were not able to maneuver through the rubble, and intense heat of the fires burning throughout the city.

Estevez then asked Arias for permission to make, through WFAB, an appeal to the listeners to donate clothes, foodstuffs, medicine, blood plasma, and anything which would help alleviate the suffering in Managua. Arias, in spite of great weariness after a long night of work, agreed without hesitation.

Children carried in their piggy banks, old people brought in wrinkled bills they had been hoarding, women delivered packages and boxes of groceries. All of these were brought to the very same studio where SIRA holds its monthly meeting through WFAB's courtesy.

Calls were received from pilots, doctors, nurses, blood donors, and others offering their services free in order to help their brother Nicaraguans. Although the magnitude of the catastrophe was great, the rapid response of the Latin-American community of Miami matched it in kind. So great was their generosity that in the vicinity of the radio station, Flagler Street and Eighteenth Avenue, it appeared as if a parade had formed.

Arias asked Estevez and Ordonez what name would be appropriate for the operation which was being conducted. Rafael suggested the name "Operation Rescue."

By Christmas Day, $71,000 in cash and three times that value in articles and food had been collected.

SIRA, because of the gravity of the situation, quickly organized a team of radio amateur volunteers which flew to Managua with portable generators and communications equipment. Hundreds of messages were sent to all parts of the world. These hams did not hesitate to leave their homes and jobs during the holiday season. Working without rest, they shared the misfortune of the Managuans. They successfully maintained communications when it was most urgently needed, and proved once again to the public that the well-trained radio amateur with his equipment is one of a community's most valuable and indispensible assets in times of emergency.

Knighthood for Heroics

It was truly a case of being at the right place at the right time when David Urfer, WA7ROJ (formerly EL5B) handled emergency communications for eighty-six consecutive hours.

Urfer had been a ham for less than a year and was maintenance supervisor for a Lutheran hospital in Zorzor, Liberia when Lassa, Nigeria, played unwilling host to an epidemic that took its name: Lassa Fever.

It was Easter, April 12, 1972, when Urfer was in the African net with Walcott "Ben" Benjamin, EL2BA, and others. During the causal round table Urfer mentioned that there was an outbreak of some sort in Zorzor and that the two doctors, Dr. Paul Merten and Dr. Joe Baum, were not sure what it was. Ben notified the Minister of Health and Welfare. A letter had been mailed but the radio proved to be timesaving.

After the authorities were notified, doctors and specialists were brought in. The Lassa Fever episode struck nine people, four of them died. Of the five survivors, two became deaf. One of those who died was an American nurse, Miss Esther Bacon, of Hauarden, Iowa. Urfer had high praise for her, saying that she was as close to being a saint as anyone he ever knew. "Esther gave thirty years and her life for humanity."

In exchange for the aid he had given the Liberian people President William Tolbert awarded him a knighthood. In his acceptance speech Urfer expressed his deep appreciation to Eloise Duncan, EL2AQ, Walcott Benjamin, EL2BA,

Dr. Gadegbeku, Bruce Adams, EL2CG, and others in Monrovia for relaying traffic from his home in Zorzor. He also thanked Charlie Wells of Greenville, North Carolina, for doing a wonderful job in eliciting advice from doctors on how to treat the fever. He also mentioned the courtesy and helpfulness of many U.S. East Coast hams who cleared the frequency for him.

After he returned to his home in Missoula, Montana, Urfer kept the knighthood award from Liberian President William Tolbert in his radio shack to remind him of all his Liberian friends.

Boat in Distress

The thirty-foot San Francisco sloop *Edith Rose* had been disabled in the Pacific Ocean for two weeks when she was blown toward shore off San Antonio Del Mar near Colnet, Baja California. With only raisins and coconuts to sustain them, the two-man crew dropped anchor 200 yards offshore, unaware that Colnet was just over the hills on Mexico's Highway One.

The captain was ill, and prompted by the atmosphere of desperation brought on by hunger, fear and the captain's sickness, the crewman swam ashore. Finding his way to Colnet, he was taken to the home of amateur radio operator Bob Rose, XE2MMK, at Rancho Santa Teresa, south of the village of San Vicente.

On Monday evening, August 28, 1972, Rose broke the Western Public Service Net on 3952 kHz during roll call to report the emergency. J. C. Ellison, K6MVF, in San Diego, who was acting as southern relay, advised the Coast Guard in Long Beach.

At 9:00 pm, PDT, Ellison moved the operation to the Flying Samaritan Amateur Radio Net. The crewman had been cared for at Rancho Teresa and was ready to return to the *Edith Rose* to help the sick captain, but he needed food supplies.

Evelyn Ammunsen, the English teacher at the Flying Samaritan school in San Vicente, opened the school's storeroom to provide food supplies, which were taken to the sloop by a local fisherman.

At 10:00 a.m., PDT, Tuesday, August 29, Ellison was

advised by the U. S. Coast Guard that the Mexican "Guardacosta" had the *Edith Rose* in tow headed north to Ensenada. For the first time in sixteen days the captain and crewman had adequate food supplies aboard.

Medical Emergency

At about 8:00 p.m. on the evening of August 31, 1972, the Mexican National Observatory/XE1PAM came up on 75m to report a serious injury to a workman. Javier Martinez was in shock with convulsions and possible neck and back injuries from a fall.

Bob Rose, XE2MMK, first picked up the call for help. The immediate concern of XE1PAM was how to handle, treat, and prepare the patient for the long and rough trip down the 9000-foot mountain to Rancho San Jose to reach a visiting medical doctor.

Wes Novotney, W6YSP, came up on frequency and telephoned Dr. Dale Hoyt, president of the "Flying Samaritans," who answered questions on what to do, and what not to do, in preparing the patient for the long journey. No stretcher was available so a door was used, with pillows packed tightly on each side of the injured workman.

The nearest hospital was in Ensenada, four hours away by car, and San Diego was three hours by air from Rancho San Jose. But because night flying is so hazardous as to be illegal, the San Diego option was ruled out by Aida Meling, XE2BY, who readied the ranch to receive the patient.

At this point Nash Williams, W6HCD, suggested that the Mexican Red Cross ambulance in Ensenada if alerted might be able to arrive at the ranch by the time the injured man reached it from the mountain top observatory.

The difficulty was that no Ensenada radio station was on frequency. Williams, therefore, telephoned Ensenada from Pasadena, alerted the Red Cross hospital, and got Enrique Garcia, XE2RH, on frequency to participate with XE2BY and the Red Cross in coordinating the complex issues at hand. XE1PAM and W6HCD remained on frequency until about 1:00 a.m.

The visiting doctor at Rancho San Jose examined the injured man and decided that the best alternative was for the patient to remain at the ranch until the following day, rather

than experience the trauma of an additional three-and-a-half hours' journey in a car or ambulance that night.

The following evening XE2BY reported that Martinez had been flown to Ensenada where it was determined that he had broken several bones and was badly bruised and dehydrated, but had no back or neck injuries. Eventually he went home to Rosarita, where he recovered nicely.

Hams Do Girl Scouts Good Turn

Saturday, March 24, 1973 was a night with a lot of action for the Fort Walton Beach area. The swapfest supper was a big success, the Girl Scouts of Junior Troop 179 went tent camping, and a line of violent thunderstorms visited the vicinity. About thirty girls, ages nine to twelve, and their leaders (including WB4GYX) planned to spend the night at Woodland Trails, a Girl Scout camp about a half-mile back in the woods next to Camp Pinchot. WB5GYX had his HR-2A along. Due to the steady deterioration of the weather, there was no electricity or phone available.

About 9:00 p.m. a severe thunderstorm could be seen over Fort Walton Beach, so WB4GYX made a call on 146.94 MHz to find out how bad it was. Steven Butler, WB4PFV, reported 50 mph wind gusts and heavy rain. Several others called in to offer assistance. Dott Smith, WA4SBS, advised that he had contacted the Eglin weather forecaster and that the area was under tornado watch and that up to four inches of rain was expected to accompany the violent thunderstorms.

It was decided to move the girls out. Harald Seeley, WB4ZKK, was asked to phone the parents to provide transportation. One of the parents was called by Alan Hinshelwood, W4BVE. The camp was completely evacuated before the worst storms hit the area.

Mercy Flight

Reprinted from *The Los Angeles Times*

A young man was bleeding to death on a hospital bed in Guatemala, and doctors were unable to staunch the flow.

German Daniel Corso, 20, a hemophiliac, suffered an injured leg in a traffic accident in Guatemala City, Wednes-

day, March 5, 1973. Doctors were forced to amputate his leg. They gave him plasma, and hoped, but Corso continued to lose blood steadily.

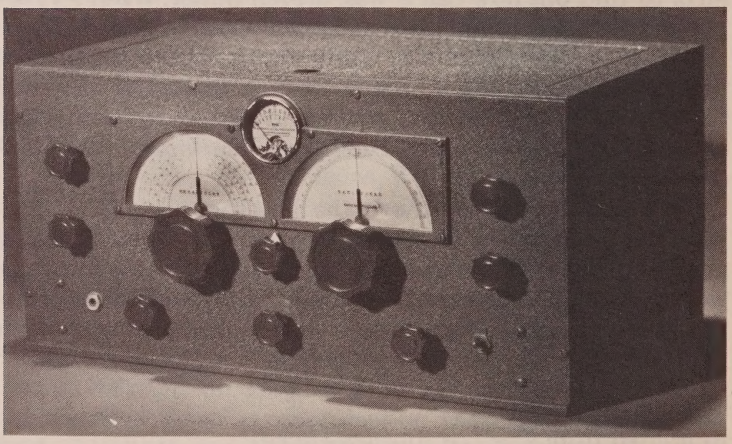
As the young man lay dying late Saturday night ham operator Harold Walker, WA6TSK, of Canoga Park, California, was tuning around on his radio. He was trying to make contact with Australia when he stopped to listen to the excited voice of a woman with a Spanish accent.

The woman, Anna Maldonado, of Guatemala City, was telling an Arcadia ham, Peter Grillo W9LVT/6, how a hemophiliac was dying and no medicine was available to stop his bleeding.

Grillo and another ham, John Alexander, K6SVL, were wondering how to find a doctor who knew where the medicine was available. Walker broke into the transmissions.

"I know a doctor," Walker told them. "I'll try to get him."

It was just after midnight Sunday morning when Doctor Don Michaelson got to Walker's home and on the radio. After talking with Mrs. Maldonado he knew young Corso needed a medicine called Proplex, which came from a Los Angeles



RME-69 introduced in 1935 and quickly adopted by serious DXers as "Standard of Comparison." Notice lack of any labelling, typical of this period. Contained "R-meter" and variable crystal filter phasing. Photo courtesy W1HR.

laboratory.

Doctors attending Corso also knew he needed Proplex, but they did not know exactly where to find it immediately, and the plasma, though it was helping Corso, was not enough.

Dr. Michaelson remembered where the medicine could be obtained. He ordered it from the Hyland Laboratories in Glendale. The problem then was rushing it to Guatemala. Dr. Michaelson decided to call the Coast Guard, who told him that such a flight could not be made. An officer at Travis Air Force Base in Fairfield, California, told him: "It would take higher authority to authorize the flight — perhaps even the highest authority."

Doctor Michaelson looked at his watch, it was 5:00 a.m. here in California, 8:00 a.m. in Washington. He phoned Capitol Hill and asked for Herbert G. Klein, White House director of communications, telling the operator, "This is Dr. Michaelson . . . it's an emergency."

Klein took the call at home.

At 10:30 a.m. Dr. Michaelson was at Hollywood-Burbank Airport with three boxes containing fifteen vials of Proplex, which were placed aboard a C-130 from Travis and promptly flown away.

When Dr. Michaelson got back to his own home in Canoga Park it was afternoon. He had been gone twelve hours, and his wife had been taking calls for him from the White House and the Pentagon. The doctor had not had a chance to tell her what was going on. "I had a lot of explaining to do," he said.

Klein told *Los Angeles Times* Washington bureau chief John Lawrence that it was President Nixon himself who had approved the dispatch of the plane, and ordered Air Force officers to cut the red tape involved in getting the plane across Mexico and into Guatemala.

Dr. Michaelson and Walker were left with a wonderful feeling of accomplishment — and considerable financial loss.

The Glendale laboratory, which is manned around the clock for just such emergencies, needed someone to sign for the medicine. Dr. Michaelson, an emergency room physician at Canoga Park Hospital, signed for $600. All the long distance telephone calls to arrange the flight — more than a dozen — were made on Walker's phone. Walker, a film sound technician, had not worked steadily in almost two years.

But they weren't worried Sunday evening after they got the word: the C–130 had delivered the Proplex to Guatemala City and the medicine was being given to young Corso. Doctors said he would recover.

"I'm dead tired," Dr. Michaelson said. "But right now, I sure feel good inside."

Radio to the Rescue

As told by Edward Dougil (Doug), W5VVP:

In the wee morning hours of June 23, 1974, heavy rains fell in the northeastern part of Pennsylvania, bringing torrents of water down into the Susquehanna River. The river normally crests at sixteen feet, but by midafternoon it had reached forty-eight feet, washing flood water into all 50,000 homes of the Wyoming Valley/Wilkes-Barre area.

Electric and phone services, radio and TV broadcasts were disrupted. This meant amateurs had to get into action.

The local Civil Defense was set up on 6m. I grabbed a rig from a nearby town and got into action from a location on one of the higher spots on the west side of the valley. There I had a good line-of-sight center of communications. As Civil Defense Coordinator I set up emergency stations wherever possible. At times we even used the police frequencies. A 2m repeater station was set up by Hamtronics in Trevose, Pennsylvania, on a mountaintop. Clegg sent up ten transceivers right off the assembly line which immediately became our best means of communication.

As Red Cross Director, I set up first aid stations, living quarters, and feeding stations. We used school buildings, church halls, fire stations and other public facilities. Also in my capacity as Red Cross Director, I coordinated efforts with one of the Army men. A Jeep was used to survey much of the disaster area. Army communications were useful, but not as efficient as 2m with the repeater. The hams, not being hampered by military procedure, were able to work much faster.

A low-band station was set up at the location with 20m, 40m, and 80m. Dipoles were used on 80m and 40m, with a three-element beam on 20m. Much of the health and welfare traffic was handled this way.

An emergency call to the Governor's headquarters in

Harrisburg, using 75m via phone patch, got a field unit of health, unemployment, and welfare officials on their way to Larksville, where I had my communications set up. A convoy of twelve vehicles came to the townhall and set up service on the west side of the river. This eliminated much traffic over the one bridge remaining out of the eight that had once served the city of Wilkes-Barre.

Ham radio was the lifeline for this valley of about fifty towns for at least two or three weeks before normal communications were resumed.

Again from W5VVP: On or about February 5, 1974, when I was operating from my hospital bed with a Yaesu FT2 Auto with scanner, I heard a cry for help on 34/94. The call was from a disabled vehicle on route I-80 near Danville — about thirty-five miles from my location in Larksville. The state police were called. They found a young couple with a very sick baby. In just a few minutes an ambulance and a wrecker were there and placed in action. Thanks to ham radio everything was brought under control.

Another winter evening my scanner had stopped on 52/52, and a ham operator, call unknown, said a bus with fifty small children was stranded in the mountains late that night. State police were called; the children were rescued from the dangers of the cold conditions, and were picked up by their parents. Due to ham radio immediate action was taken. CB radio could not have made the contact.

Mayday

There was a drama on the high seas and 20m SSB on June 1, 1975, when amateur radio effected a rescue.

It began mid-afternoon when an obviously inexperienced operator appeared on the Maritime Mobile Net at 14.313 kHz calling "Mayday." Listeners quickly learned that the captain of the yacht *Honey Bee* two days out of the Virgin Islands, bound for the States, had had a heart attack. He died soon afterward. Five inexperienced people were aboard, and the vessel was rolling badly in heavy seas.

Net listeners alerted the Coast Guard, and WB4SQJ (Miami CG Rescue Service Club station) and WB5KTY/5 (New Orleans CG) came up on frequency. Direction-finding stations determined the location of the craft and, by means

of an on-frequency consultation, they helped it turn around and head for the nearest land, Grand Caicos. In the meantime a VE7 had found George Thompson, VP9GT, of Grand Turk down the band and had brought him on frequency. VP9GT, familiar with both islands, recommended bypassing the difficult anchorage at Grand Caicos and continuing on to Grand Turk, where an easier landing could be made the next morning.

The drama continued through the night as the gods of propagation smiled and 20m stayed open. About a dozen active stations and probably hundreds more just listening stood by and monitored the *Honey Bee's* progress. Phone patches were run to the passenger's families and to the ship's owner, Sidney Gutkin K2PSO. It was his foresight in leaving an on-board TR-4 tuned up on 14.313 and instructing the crew to "turn it on and yell for help" if ever they got in serious trouble, that made the rescue possible.

Nineteen hours after the first "Mayday," the *Honey Bee* was talked into Grand Turk harbor by VP9GT. Hundreds of sleepless amateurs breathed signs of relief. Listeners commented on the extraordinary discipline displayed during the long operation, both by the active stations and by those just monitoring. "Well done!" to all.

Xenia Tornado

On Wednesday, April 3, 1974, the most widespread disaster (according to press reports) ever to strike the United States occurred. Tornadoes struck major areas in the midwest, with Xenia, Ohio, being hardest hit. Hundreds of homes and buildings were destroyed. All power and telephone lines were disrupted.

While Central Ohio AREC members were on their way home from work, at about 5:00 p.m. the news was announced. Immediately a Yellow Alert was issued from W8ERD/M via John Feazell, WB8GVI, at his home station. All AREC members were apprised of the situation and plans were made. At 7:30 p.m. the State DSA station W8SGT, was activated by Stephen Moore, WA8LUR, Ralph Rickett, W8BTW, and Robert Wilkey, W8VMS. At 8:30 p.m., the Columbus Red Cross Station K8DDG, was activated by Richard Kerns, WB8LBC, and by WA8LUR. The AREC 2m and 10m nets

were in full operation.

The Red Cross formed a caravan of relief vehicles and requested an AREC communications team to accompany them to Xenia. The first wave of amateurs included George Morris, WA8RUT, John Chapman, WB8INY, Gary Grebus, WB8IBZ, Thomas Lusch, WA8ZTV, Terry Douds, WB8CKI, Dennis Mueller, WB9EBU, WB8RDY, and Victor Kean, WB8OSC. They arrived in Xenia at 2:00 am on Thursday, and immediately set up at the Red Cross organizing center in the downtown Xenia YMCA. Communications between the AREC team and Columbus were via the W8ERD kilowatt station on 2m FM, using both 146.46 simplex and the 13/73 repeater in Springfield, located about two-thirds of the way from Columbus to Xenia. Local communications in Columbus were via the AREC nets on 50.54 AM, 29.000 SSB and 146.46 FM. Red Cross administrative traffic continued throughout the night, coordinating a continuing stream of relief supplies such as food, water, cots, portable toilets, clothes and bandages.

Early Thursday morning, the AREC field team put an outbound message service into operation, sending ARL ONE type messages from local residents. This was done via the Ohio SSB net on 3.9725 MHz. The message service's availability was announced to residents on the YMCA public address system.

The AREC field team operated from their gasoline generator which also supplied power to two broadcast station remote origination units and to other late-arriving amateur groups. A relief crew was dispatched Thursday afternoon, consisting of William Clausen, W8IMI, Klaus Ziermaier, W8CRX, John Richards, WB8NNK, Jeffrey Maass, WB8JXS, Jack Shepherd, W8OMY, and Ralph Rickett, W8BTW. In addition to providing the needed Red Cross administrative messages, the AREC field team fanned out in the area and assisted in many other ways. Walkie-talkie units helped Dayton Rescue Squad workers in digging victims out of the debris. A water truck was dispatched to where it was needed. A nurses corps was assisted in their house-to-house visitation and inspection tours. WB8CKI helped the Red Cross make sandwiches while he provided communications from their mobile canteen. He also rode in a National Guard helicopter with Red Cross officials to provide com-

munications as they surveyed the damage from the air.

Meanwhile, back in Columbus, inbound query traffic was being telephoned into the Red Cross at a great rate from area friends and relatives. This was sent via 75m to William Shaeffer, WA8MCR, in Dayton, or was hand-carried by the relief crews to the Miami Valley FM Club, which was handling the people-finding service. Eventually about 1500 inquiries were processed.

Various state agencies in Columbus began to hear that the Columbus AREC could provide communications into Xenia and began telephoning W8ERD to originate traffic. Some of the more interesting traffic included: The physicians and nurses group in Xenia requested advice from Columbus Red Cross concerning typhoid vaccine, which they immediately administered. The Ohio department of Education and the President of Central State University (which was largely destroyed) exchanged messages about what to do with students and what technical assistance was needed. The assistance was then dispatched: The Green County Memorial Hospital and the Columbus Blood Bank coordinated blood supplies; the Ohio Associated Press inquired about a fire at Central State and stated they had a half-hour press deadline. We got their reply in time for the deadline. Columbus Red Cross called Xenia Red Cross with an emergency message: one of the victims was known to require special medication, but Xenia doctors did not realize it.

The operation continued around the clock until Sunday, April 7, supplying daily relief crews and provisions. On the third day, a high-speed CW link was established on 80m CW, and it proved to be the most reliable link of all. On Sunday afternoon the AREC field team returned to Columbus. NTS activity continued for several more days, carrying replies to earlier inquiries. The activities during the height of the operation were so many that we lost track of exactly who did what, but many AREC members operated from Xenia, from Columbus Red Cross, from W8ERD, from the OSU Club station, W8LT, and from their homes.

Tangle With Fifi

Ruth Paz, HR2RP, of San Pedro Sula, Honduras, has been a licensed amateur radio operator since October 1968,

and had begun plotting the course of Hurricane Fifi on Tuesday, September 17, 1974. When Tom, W9LII, arrived he assisted in this activity. They plotted the course of the hurricane across the Honduras north coast and on a road map and it didn't look as if San Pedro Sula would get any of the wind because they were about 150 miles from the center. But about 9:15 p.m. Wednesday night, the barometer started to drop so fast that Tom broadcast a new reading every thirty seconds.

Those with steel nerves got some sleep, but about 4:00 a.m. on Thursday, September 19, it really began to blow, and things started hitting the house. Ruth was awakened when the wind blew rain through an open window onto her face.

The Paz home was a large house with many bedrooms, and there was one room just inside the door which was large enough to hold twenty-five or thirty people (a good thing because there were ususally that many people there).

By 6:00 a.m. Ruth was at her radio beginning a daily vigil which would continue for more than a month. At 8:45 a.m. the electric power failed and HR2RP went off the air.

The telephones in San Pedro Sula had already been out of order for several weeks before the hurricane hit Honduras, so the last link of communication failed when the amateurs were forced into silence by the loss of power. HR2RP was off the air for only a short time, however. Scotty Michelson, HR2ASM, got an auxiliary power plant from the Caterpillar Tractor Company sales office and brought it to Ruth's house for Tom, W9LII, and Fr. Ron, HR5JDC, to set up. For a time, HR2RP was the only contact between flood-ravaged Honduras and the rest of the world.

At first, Ruth just reported what was happening — trees blowing down and debris hitting the house. At one point Tom and Fr. Ron tried to lower Ruth's quad to protect it, but there was so much stress on the tower from the wind that it was not possible to activate the crankdown system. The tower rode out the 135 mph winds without any damage, though Tom and Fr. Ron got soaked. They got sopping wet again when they climbed the tower to put up a temporary 40m dipole, and again when they put up a 2m whip. These latter two antennas were vital for local communications, especially when the airport became separated from the city by flood water.

Ruth's station became one of the major communications centers. There was a regular parade of government officials, persons seeking lost relatives or others hoping to assure relatives of their own safety, crews of medical teams and television network reporters.

Ruth assisted in the procurement of medical supplies, gave up-to-the-minute weather reports and landing conditions, met shipments at the airport, and tried to locate lost shipments. Ruth handled only a few "health and welfare" inquiries because the phone lines were down. She answered those whose names she recognized immediately and made lists to send out by runners to inquire about others. San Pedro Sula is very large and it takes more than a name to find a person. There was little damage to large cities and towns, but rescue teams had to be parachuted into the town of Choloma where almost all of the 4,600 residents were killed or missing. A dam had burst, throwing earth, water, and rocks on the town; there was no way to get any "health and welfare" in or out of that area.

Most of the inquiries in San Pedro Sula were the same, "no damage, we are all right." But, in Choloma, just six miles north, thousands died from the flooding. "People came in telling of mud up to the roof of their homes or saying, 'I just saw my husband floating down the river.' They were still in shock! It hadn't hit them yet. It is hard to tell just how bad it really was . . . with all the dead bodies around and more still coming in."

Even after the rain and wind stopped, San Pedro Sula was still without utilities. Cars lined up all day, day after day, to use the well at Ruth's house which was one of the few sources of uncontaminated water left in San Pedro Sula. Periodically they would have to shut the pumps down to keep them from burning out. "We didn't even want to think about what would happen if the water ran out."

This valiant woman, Ruth de Paz, HR2RP, had exhibited extraordinary poise for long hours over more than thirty days.

Amateur radio operators in the United States, Honduras, Canada and several Latin American nations jointly undertook the responsibility for providing emergency communication service in the wake of Hurricane Fifi, which devastated one third of Honduras. The day after Fifi struck, September 21,

1974, Dr. Enrique Avilar, Minister of Health in Paz, established an emergency communications coordinating committee — COPEN, headed by Honduras amateur operator Alhandro Talbott, HRIALT. An emergency base station, HRCPEN, was set up at Tegusigalpa, and coordination of amateur support efforts was made with Noel Eaton, VE3CJ, Watertown, Canada, president of the International Amateur Radio Union, and Harry Dannals, W2TUK, Dix Hills, New York, president of the ARRL.

With the assistance of the ARRL and a group of Miami amateurs, four long-range high frequency stations and a repeater station were delivered to COPEN to fill an urgent need for equipment to provide communications both within Honduras and with the outside world.

During September 21 and 22, more than 200 amateurs in the United States and a larger number in Central America handled emergency messages and requests for supplies relayed by Honduras-based amateurs. Most of the United States amateurs were members of the American Radio Emergency Corps, and other service organizations that operate long-established emergency communication networks and train regularly in preparation for emergencies such as that in Honduras.

Much of the emergency amateur radio activity was centered in the Miami area. The week after Fifi struck, a team of bilingual amateurs from Miami's Sociedad Internationale de Radio Aficionados (SIRA) flew to Honduras to assist operations there.

Hurricane Eloise

In September 1975, amateurs throughout Florida and the neighboring states responded to the need for emergency communications when Hurricane Eloise struck a devastating blow to the area from Fort Walton Beach to Panama City.

It was anticipated that Eloise would make a landfall between Pensacola and Mobile, but a shift in direction at about 0300Z Tuesday brought her over the Panhandle with winds estimated as high as 130 mph.

The Northern Florida Phone Net was activated on a standby basis at 2000Z Monday and was put in emergency session at 0200Z Tuesday to handle emergency and priority

traffic. The Florida Amateur Sideband Emergency Net was activated at about 1450Z Tuesday to handle health and welfare traffic. When propagation conditions worsened, other channels for "H and W" traffic were opened on 3957 kHz and 7250 kHz.

Amateur radio contact with most cities in the affected areas was maintained throughout the storm. However, the Area CD HQ in Defuniak Springs lost its tower and all antennas at about 1200Z Tuesday, interrupting all communications until the next day. The Okaloosa County EOC lost its tower and all antennas at the height of the storm but maintained local communications on 2m from the mobile CD unit.

The barometer registered a low of 28.52 in Fort Walton Beach and wind gusts there measured 95 mph.

In spite of the extensive damage done by Hurricane Eloise, no deaths or serious injuries directly attributable to the storm were reported.

Since complete information is not available and space does not permit a listing of all amateurs who served during the storm, no calls are included here. Suffice it to say that the many amateurs who responded to the need for emergency communications by furnishing their own equipment and putting in many long hours, and in some cases risking their personal safety, have further enhanced the tradition of amateur radio and added another chapter to the long and honorable history of amateur radio service.

Trapped

On March 21, 1978, twelve Boy Scouts, accompanied by two Scout leaders, began a two-day and overnight camping trip. The plan was to use vehicles to drive up deep canyons to the top of Joaquin Ridge near Coalinga, California, park the vehicles, and proceed on foot to Three Rocks.

Fortunately, Don McNeeces, K6VWF, the trustee of WR6AOU, located atop the ridge, was one of the leaders. It was also fortunate that he had the presence of mind to take along a hand-held unit that could work through the Sequoia Pioneer Amateur Radio Club repeater, if the need happen to arise.

What originally was planned as a fun-filled outing turned

into an ordeal filled with tension, misfortunes and calamities. Flash floods, mud slides and boulder avalanches struck suddenly and without warning, isolating the entire group.

The 147.93/33 2m repeater was the only one that could be accessed. Anxious parents, concerned citizens, and monitoring amateurs were quickly apprised of the situation.

The group was now trapped halfway down a steep canyon. It was apparent that the group should return home as fast as possible, however, the side of the canyon was extremely slippery.

Traversing the slick, mud laden hillside could be done only if all members of the party tied themselves together with a handline, then slowly and painfully pulled themselves to the summit. This they did, but only to find that their vehicles had sunk deep into the mud. After hand-winching them to the road, the homeward-bound trek began.

By now the weather was clearing, but torrential rains had blocked the downward descent with boulders and tons of mud. The more the group descended, the worse the reports became.

The downward descent finally reached an impasse when the four-wheel drive vehicles stuck in the mud. Use of a winch was ruled out, as boulders too large to move manually blocked the way.

Two-meter progress reports now became urgent calls for help. Larry Allen, W6NKJ, Bob Silvia, WB6VFZ, and Harold Ebury, W6IYY, working together, arranged for a heavy construction vehicle to remove some of the large boulders. Working their way up from the bottom, they were able to come within a half-mile of the stranded group. A rain-swollen creek prevented further road work.

It was a muddy crew that walked or waded the last half-mile to a large four-wheel drive vehicle, waiting to take them home. The downward-descent vehicles were abandoned, to be picked up another day.

Amateur radio, at no cost to the taxpayers, had again prevented what could have been a massive rescue effort. It was demonstrated once more what a well-organized volunteer organization with good communications can do. From start to finish, all involved parties had complete contact with one another, making possible the teamwork that accomplished a successful ending.

Certainly helicopters and aircraft could have performed the job. However, you'll never convince the Scouts' families and friends that it would be anything less than "hats off" to amateur radio, WR6AOU and the Sequoia Pioneer Amateur Radio Club, for giving a potential calamity a happy ending.

Boy Saved in U.S.S.R.

Around 5:00 pm local time, March 11, 1978, Bill Bennett, W7PHO, was operating on his favorite frequency in the 20m band. Unexpectedly, Victor Melnikov, UVØEXO, called him. Victor's usually fine command of the English language was seriously challenged by his excitement. After several attempts Bill was finally able to calm Victor enough to piece together his story.

In Victor's hometown of Kholmsk City, Sakhalin Island, U.S.S.R., a young boy had fallen down thirty feet of stairs and punctured his skull. Blood was flowing profusely into the brain. The drug Gamalon was desperately needed to save the boy's life, but none could be located on Sakhalin Island. Victor was sure an adequate supply could be found in Japan.

Bill immediately telephoned Robert Fujii, W7OTO, in Bellevue, Washington. Bob came on frequency and used his fluent Japanese to raise Naito San, JA3CHO, in Osaka, who called Dr. Kawai San, JA3FPZ.

After hearing the situation from Bob, Dr. Kawai San located a supply of the drug and sent it to the airport at Osaka for immediate air shipment to the Russian Embassy in Tokyo. The drug reached Kholmsk City within half a day. A later report said that the boy, although still in critical condition, was saved by the drug.

Tragedy Averted

A high seas tragedy was averted by amateur radio after the sixty-two foot racing sloop *Sorcery* did a 360° roll in the north Pacific on Saturday, May 8, 1976, while en route from Japan to the United States.

Mabel Walters, W6YLT, from onboard the *Sorcery* broke in on Fred Boggs' (W7SRU), 20m QSO and was heard by Harold Berry, KL7HAY. Mabel reported the craft was dismasted and several of the people on board were injured.

The Coast Guard was advised, whereupon it dispatched

an Alaska-based plane and cutter, both of which joined the growing group of amateurs (including Mabel's husband Glenn Walters, W6MUY) with W6YLT/MM on 20m.

A nearby merchant ship, alerted by the Coast Guard, also came up on 20m and — after the wreck had been located by the Coast Guard aircraft — was the first ship on the scene.

The Coast Guard cutter *Mellon* reached the *Sorcery* Sunday afternoon, and after taking off the crew and treating the injured, took the craft into tow. During the twenty-four hour interval after the first "Mayday" from W6YLT/MM, however, it was amateur radio that supplied communications and kept the frequency clear.

Summons Aid

Aboard the yacht *Mandorla*, located about 500 miles north of Papeete bound for Hawaii, Kaarin Schwabe, an American YL, was stricken with hepatitis. The emergency was picked up by the Pacific Maritime Mobile Net with Robbie Beets, YJ8AN, acting as net control.

Signals from Jeanne Longdelder, HP9XAW/MM3 aboard the *Mandorla* were weak; it became clear that propagation conditions were such that a widespread group of stations would be necessary to maintain contact with the yacht.

Ken McCormack, C21KM/MM, aboard the *MV Enna G*, offered to relay because of his favorable position in relation to the yacht. Capt. Kroese of the *MV Enna G* instructed Ken to maintain continuous watch if necessary. Ken was aided by the chief engineer who monitored during Ken's routine ship's duties.

Maury, HP2BKZ/MM3, had a doctor with him aboard the *Yankee Trader* and passed information on how to treat and feed the patient. Lloyd Haverman, WA7HNY, in Seattle provided phone patch facilities with the family and friends of *Mandorla* crew members.

The *Mandorla* turned back to Papeete with her patient unconscious, her breathing difficult. Jeanne, HP9XAW/MM, was attending the patient and keeping schedules with those standing by the emergency. KJ6CW, the USCG Loran Station on Johnston Atoll, passed reports of the situation to RCC Honolulu and a phone patch was run to the RCC doctor.

With the seas becoming heavy, the patient was unable to rest and her condition continued to deteriorate. She was in severe pain. Jeanne reported a twin-engine aircraft circling above the *Mandorla.* VHF Channel 16 was aboard the yacht but no contact was established with the aircraft. The aircraft dropped messages in two bottles that the tug *Hyppototame,* with a doctor aboard, was headed from Papeete for a rendezvous with the *Mandorla.* Rendezvous was made, the patient was transferred by small boat and the tug proceeded to Rangaroa. There the patient was airlifted to Papeete and hospitalized.

Radio contact with the yacht was maintained throughout the emergency period April 6-9. Operations were conducted on the regular Pacific Maritime Net frequency, 14.313 kHz, by a group of amateurs including YJ8AN, WA7HNY, P29EM, HP2BKZ/MM3, C21KM/MM3, KH6IRP, KJ6CW, K8MLM, KH6HFJ, W7AIW, W7GYR, WA7URX, W7VM, and a list of standby stations too numerous to list. Once again we have seen the dedication of the ham radio operator exemplified. Amateur radio does have a place of great importance in the field of communications.

Amateurs Respond to Windstorm

On the evening of December 20, 1977, the gale winds which had been increasing all day puffed up to velocities of 45-50 mph, with gusts reported of more than 90 mph over the coastal area of Humboldt and Del Norte counties in California.

As he left work Joe Herman, WA6CAL, our emergency coordinator, called an emergency net on the repeaters of the FWRA. Joe stationed himself at the parking lot of the Eureka Police Department and gathered a group of mobile volunteers who cruised in the Eureka-Arcata area, spotting hazards such as downed power poles and lines, trees and buildings tumbled across the streets and roads, and storefront windows blown out.

All problems were reported through the EPD to the appropriate agency or person. Blown storefronts were guarded until the owner or manager arrived to take charge. The net continued operation until well after midnight when the winds finally subsided.

Among those who responded to the emergency need for mobile communications were Joe Herman, WA6CAL, Jim Myers, WA6ICB, Don Nelson, WA6NBG, Ron Rose, WB6SXJ, Vern Huntus, WB6RTE, Ted Collins, WA6GSR, Terry Farrelly, WA6LIA, and Art Seymour, K6MZN. Others monitored from home QTHs.

Although some damage was suffered by the repeater system on its high mountain peaks, and power from commercial sources went out all over the area, the system continued to work and communications were effective.

Bakersfield Hurricane

On December 19, 1977, Bakersfield, California, was hit by a hurricane which unexpectedly came ashore, causing 100 mph winds that lasted 10-15 hours.

The next day W6LIE was activated as an emergency station at the Red Cross building in Bakersfield. During the duration of the storm a total of 196 autopatches were made through WR6BBK. Charlie Poehlitz, WB6WPE, stayed up twenty-four continuous hours handling traffic at the Foothill High aid station. There were sixty messages handled on WR6ACE.

Forty-three amateurs took an active part in the operation, while others monitored in case their services were needed.

An estimated one-quarter million dollars were saved due to local amateurs keeping travellers updated on road conditions.

Real Thing Cancels Simulated Drill

Let's face it, amateurs are highly motivated people who are ready to provide help when needed. This was shown to be true during the month of January when the winter weather went wild. We have read about such situations "up North," but this time it was here in North Carolina.

On Friday the thirteenth (there may be something to that old superstition!) the ice began forming on the trees and power lines in and around Alamance County. In the early afternoon, the power to the WR4AKY repeater was lost and it went off the air.

However, this didn't bother the "home from work" group that was switched over to 52 simplex and set up an informal net to keep everyone informed. But as the darkness came and the temperature fell, and the ice continued to form, power and heat was lost in more and more homes. It seems that most of the amateurs had some form of battery or generator back-up so a "watch" was still maintained.

About midnight came the request from the Civil Preparedness Office for help. Sick and elderly people who could not remain without heat very long needed to be transported, shelters needed to be established. Nursing homes needed generators to restore heat since their patients could not be moved. The power lines that were down and still "hot" needed to be quickly reported. All of this required communications and the Alamance County ARES was quick to respond.

Fortunately most of the telephones in the area were still working, however, they soon became overloaded. Many shelters had only one overworked telephone, with people calling family and friends. Information was needed to and from many locations.

And so, the amateurs set up at the shelters, in the vans transporting the elderly, at the Civil Preparedness Office, at the National Guard Armory, and at the Power Company office. Some of them formed roving patrols to check for trees blocking roads and downed power lines.

Finally, on Sunday afternoon, the services of the ARES were no longer needed, power was restored to most of the area. The hard-working amateurs went home to well-earned rest—and to fallen trees and downed antennas.

But peace was not yet to be. On Thursday, the rain started and the temperature dropped! Ice formed while you watched. It was even thicker than it had been five days before.

This time a battery had been installed and the repeater stayed on the air. Everything seemed to be under control and the ARES requested to only go on a "low profile standby status." A newly established information net spent a few minutes each half-hour gathering reports from all over.

About 1:00 pm the rain stopped and the net was secured. Weather reports indicated warming for the next day. Everyone went to bed thinking all was well.

About 3:00 a.m. Friday a strong wind came up. Ice-

laden trees toppled everywhere. The melt from the previous weekend's ice had softened the ground and many trees were completely uprooted. Power went off everywhere. Very few sections were unaffected — fortunately these were where shelters were located.

At 4:00 a.m. the ARES net went back into emergency session and the amateurs responded quickly. It was a repeat of the previous weekend. Six-hour shifts were scheduled and from 6:00 a.m. Friday to 6:00 p.m. Sunday all posts were manned and operating.

Again, the process went smoothly, each person knowing what to do. When practice sessions are held over the years, everyone develops an attitude of "it can be done and I can do my part." This was very evident in the "professional" and organized manner in which all the participants operated.

You may have noticed that no calls or names have been mentioned in this story. There were over forty amateurs who participated during the two weekends. It would be difficult to try to name them all and not leave someone out. Then too, no one was there for the recognition or "glory" or to

Modern station NN3SI at Smithsonian Institution to demonstrate amateur radio to the visiting public. John Swafford W4HU is the operator on duty.

get their names in print; each amateur was there because s/he "wanted to help." I can think of no higher compliment.

By the way, Alamance County elected to forgo a simulated emergency test during the last weekend in January.

Jungle Rescue

On April 2, 1978, Herb Ridgley, K4GGX and HK3BMK were enjoying a nice chat on 20m when Al Touchette, WB6MID/8R3, calling from the jungles of Guyana, broke in.

A five-year-old boy had been hit on the head with a baseball bat and had suffered a serious concussion. At Al's request, Herb called a Georgetown rescue center in Guyana from Miami.

As a result of the call, Paula Adams, WB6MMH/8RI, in Georgetown, came up on frequency but was unable to make direct contact with WB6MID/8R3.

Instructions were then relayed from Georgetown via Herb to Al. A plane was to be dispatched from Georgetown to a jungle airstrip to pick up the boy. The boy was to be carried by jeep to the airstrip to meet the plane.

Herb then called Baptist Hospital in Miami and explained the situation. Dr. Maurer, a neurosurgeon, was patched through K4GXX with instructions to Al. Meanwhile, HK3BMK and John, WD4KRZ, were chasing interference off the frequency in an attempt to keep the channel clear.

Ron Johnson, WB8UWQ, then went to the MARCO net and brought Jack London ("Dr. Jack"), K2JVA, on frequency. Dr. Jack gave more medical advice directly without the need of a relay.

As skip conditions changed, Guyana amateurs set up a 40m sked. We are unable to give the final outcome of the boy's treatment. However, we do know that he was in good hands.

The parts played by Herb Ridgley, K4GGX, and the other amateurs who helped represent to this author what amateur radio is all about.

The Blizzard of '78

At 2:00 am EST on January 26, 1978, the wind began to blow and the snow began to streak across the landscape,

causing a white-out that would do credit to an Antarctic winter storm.

At 3:30 am the power went off all over Washington Court House, Ohio. Our furnace blower stopped and we lost our heat.

I went back to bed, but my wife stayed up all night listening to the radio reports on a transistor radio, and took notes for me until I woke up. At 8:30 a.m. the power came on again, and, after several short interruptions, stayed on.

Soon after that, Paul Woods, Disaster Services Agency Director, phoned and asked if I could get the amateurs together for help in communications. In 1977 he had depended on CBers, but they didn't do much good because everyone wanted to use the CB to talk to each other about the problems they were having. I told him that the hams would do better.

Since I am communications officer for the DSA and we have a RACES license, it was my task to turn on my 22S and ask for volunteers for emergency service. The repeater is owned by Kenny Long, WB8NGX, and is on around the clock.

The response was immediate and exciting. Twenty-six amateurs checked in and offered to do "whatever you want me to do."

The first thing we needed was an operator to take a 2m FM unit to the DSA headquarters office so that we could have immediate communication. A flood of inquiries had so tied up their single telephone that it was almost impossible to call in or out. An additional difficulty was that it took almost three minutes for the dial tone to come on due to the heavy phone usage.

During the extreme freezing weather last year a special unlisted phone line had been installed, but this snow was so heavy and so badly drifted that the telephone people were unable to get anywhere to install additional lines. The same condition prevented installation of extra lines to the police and sheriff.

As usual, everyone thought that since there had been an emergency last year there certainly would not be another again so soon.

Art Swadner, WB8EEB, volunteered to take his equipment to the DSA office if someone would pick him up. The

DSA sent their four-wheel drive vehicle for him. As soon as he and his gear arrived communication was independent of the jammed telephone lines.

Five amateurs volunteered to take portable hand-held equipment to the DSA office, and to provide mobile communications for the DSA rescue squads' four-wheel drive vehicles.

We also had several novices who could not operate 2m, who monitored channel 9 on Citizens Band and picked up calls for help from motorists and homes. They then called me by phone and I called the sheriff, wrecker, or police as needed. Whenever possible we notified the person who called via the 2m/CB relay that his message was received and what the reply was. The novices had scanners on our repeater frequency. The callers did not know that they were being monitored by hams with CB sets.

The Rev. Phil Brooks, WD8DPI, of the Methodist Church, obtained much food, many blankets, and quantities of other supplies. He, with several other churches in the city, prepared for an influx of stranded travellers, as there were about a thousand people stuck on the interstate ten miles away.

At the height of the storm the city was completely cut off; making a telephone call out of town was difficult. Ham radio filled the gap.

The only time CB was used in any useful manner was when I got a call from the Red Cross asking that I locate a trucker. His wife called from Kansas City and said that he was to make a delivery here and she had heard nothing from him nor had the company where he was to make the delivery.

I told her that I would not attempt it by ham radio but would turn it over to a CB club. In several hours he was located at the fifth motel called.

One of the more active hams, Gerald Ragland, WA8BOB, was head pharmacist at the local hospital. When home he worked 2m FM, and when at the hospital he took his rig along. The hospital had occasion to need 3000 pounds of IV solution from Dayton, Ohio, about forty miles away. All the arrangements were made by his unit and my telephone calls. The hospital was so impressed that they are buying a unit to keep handy for use in an emergency.

Jack McKirgan II, WD8BNG, who has one of the re-

peater receivers installed at his home, handled seventy-six messages through other repeaters to surrounding cities. We can access twelve repeaters from here.

I handled telephone traffic and the coordination of the amateurs in our group. There were twenty-six hams on call at all times. At a rate of about four phone calls per hour I handled over 200 calls. I was on continuous duty for more than forty hours. We felt proud of the operation. We learned a few things, too: First, the most obvious, have a battery supply in case the power goes off. There is nothing like a dead repeater for frustration. Second, have unlisted lines to law enforcement offices. Last year they were put in, but this year the snowdrifts prevented installation. Why weren't they left in? The bureaucracy in its great wisdom figured that the worst storm of the century could not be repeated again this year. They were wrong. Thus, all lines were tied up — emergency calls had to wait. Moral: plan ahead, assume nothing. Remember Murphy's Law.

If you want road information don't call the sheriff or police. Call the Highway Department. They handle road clearance and they know what is open and what is closed. Furthermore, their line is less likely to be jammed. It took us a day and a half to find this out and we found out from the former DSA director. He had been through the emergency last year. Another point: check with people who have been through it before.

If you look at what we went through and what the eastern states went through, you will see that you must be able to operate when all roads are closed, all streets are closed, nothing can move, power is off, all businesses are closed, groceries are unavailable, there is no mail, and panicky people jam the telephone lines. Fortunately my phone was never flooded with calls.

When I heard the storm was coming, I got plenty of food in, and except for five hours without heat and power I got along fine. I don't know how I would have fared with the forty-eight hour loss of power that some people experienced, but I am thinking about it. I am wondering about a generator, although many who had them could not reach them because of heavy drifting, and some garage doors blocked by the heavy snow.

Also, as a result of our experiences, we have installed an

FM receiver on the repeater frequency at the DSA headquarters, and the director is studying to become a ham.

There will probably be those who say that we should have used formal messages in approved ARRL form, and that all orders should have been signed. They have never been in a snowstorm where it was an achievement merely to get your car started, or even uncovered so you could get into it.

In one case we did not want to put the address of a young woman with two children on the air. She was to be picked up and brought to town. There are kooks who would have called her or gone to her house, and we wanted to avoid that, so we used the telephone to call a station and had him give the instructions and her phone number to the mobile unit on a private simplex circuit. The rescue went through smoothly, and it was never on the repeater.

You would be surprised at the number of scan ers in private homes with not only police and sheriff frequencies, but the amateur repeater frequencies.

The idea of having novices monitor on a scanner and also channel 9 on CB was a real winner. We got about five or six motorists out of trouble on the Interstate, and dug some out of snowdrifts on the state routes, which were icy though cleared.

If you want to know what foods are cleaned out of the supermarkets first, they are eggs, fresh and dried milk and bread. These are perishable and with no new deliveries they soon run out. Vanilla ice cream disappears quickly too. Canned goods are no problem — most markets have plenty of them.

Wood County Hams

Along with hundreds of other volunteers in Wood County, Ohio, area amateur radio operators did their part to help fight the blizzard of '78.

Within hours of the onset of the snow, amateur radio station K8TIH, operated by the Wood County Amateur Radio Club, was on the air at the Disaster Services Center of the Wood County courthouse. The station, staffed by club members, was on the air for the next six days providing needed radio links around the county as well as around the country. More than twenty amateurs helped in the communi-

cations effort.

In addition to the station at the Center, portable amateur stations were set up at the Wood County Airport to help coordinate and dispatch the helicopters and fixed-wing spotting planes throughout the air relief stages of the emergency, at the fire station in Haskins (where amateur radio was the only reliable communications in and out of that community for several days), and at the helicopter control center of the courthouse.

"One of the biggest assists the area amateurs gave was the freeing-up of already scarce phone lines around the city and county," commented Bill Wilkins, an employee of General Telephone Company of Ohio and president of the Wood County Amateur Radio Club.

"Dozens of messages each hour had to flow from the courthouse to the airport and the helicopter dispatching center. These were all taken care of by amateur frequencies, thus easing the strain on the phone service.

"Quite often the phone lines to the Toledo area, where the helicopters were stationed, were swamped with calls and the only immediate link with the people in charge up there was through the amateur station at the courthouse or the airport."

Though this procedure was not followed in the Wood County area, in Lucas County most of the helicopter missions had an amateur operator with a hand-held radio on board to provide a direct link to ground control stations. This kept the aircraft frequencies clear for air traffic control transmissions.

Several of the area amateurs were without power for periods ranging from a few hours to more than three days. Radio communications were maintained at these stations by the use of emergency battery power.

When the power went off in Weston and Toledo Edison crews were unable to get through to the substation to do their repair work, an amateur, who is a resident of Weston, contacted Edison personnel in Toledo via his amateur station (operating on emergency power, of course). The Edison people told him what to look for at the substation. With the help of area snowmobilers he was able to make several trips to the substation, look for the things that the Edison personnel had told him about and report back his findings on

the radio. Finally, with the Edison staff making the diagnosis over the radio, the problem was solved and power was restored to the community.

In addition to the countrywide communications provided by the amateurs, more than thirty health and welfare messages were handled through the disaster services' amateur station. These messages involved relatives or friends of Wood Countians who were unable to get through to them on the telephone. They resorted to asking amateurs in their home communities all over the country to send inquiries about their snowbound friends. These messages were relayed through other amateur radio stations and eventually ended by being processed by K8TIH personnel. This public service is not just reserved for emergencies; it goes on 365 days a year throughout the world. There is never any charge for this or any other amateur radio service.

Another service provided by the area amateurs to the Disaster Services Agency was current weather information. A portable amateur station was set up at the National Weather Service at Toledo Express Airport. This station relayed up-to-the-minute weather information to amateurs in several counties, including Wood.

The weather information was given to the local disaster service personnel. Each time the weather update was received and posted on the window outside the amateur station at the courthouse, an understandably anxious crowd of civil defense and disaster service people crowded around to see what Mother Nature had in store for Wood County for the next few hours.

Throughout the year, whenever there are any severe weather warnings or watches, the amateur station at the courthouse is staffed and weather information is made available to those who need it.

Amateurs Not Buried by Record Snow

New England will long remember the blizzard of '78 when on Feburary 7, approximately thirty inches of snow fell in the Boston area. Accompanied by hurricane force winds gusting up to one-hundred miles per hour, the storm left death and destruction in its wake.

These heavy northeast winds accompanied by new

moon high tides caused severe coastal flooding. The tides washed the homes and property of thousands into the Atlantic Ocean.

About five-thousand rush hour motorists were stranded on the highways of eastern Massachusetts. Their rescue and the removal of their vehicles compounded the already difficult snow plowing task. Assessing the situation on February 8, the governor declared a state of emergency and banned all but emergency vehicles from the roads.

In effect, the entire state of Massachusetts was shut down for the first time in history. The National Guard was called out; federal troops were called in; civil defense was called up; amateur radio was called to the rescue.

By foot and special vehicle, amateurs with 2m FM equipment were deployed to hospitals, Red Cross, Civil Defense headquarters, armories and public shelters. To provide mobile links, they went out in ambulances, other emergency vehicles and National Guard vehicles.

Communications were maintained on highly disciplined repeater nets including, among others: 04/64, Waltham Repeater Association; 22/82, Minuteman Repeater Association; 96/36, Middlesex and Wellesley Amateur Radio Clubs. The vital tasks amateur radio performed in public service as the only available communication system are too numerous to mention.

It quickly became evident that amateur radio was more than a back-up mode when the phone lines went dead. Indeed, it was the other way around! Two-meter communications were unmatched for capacity, speed, deployment, reliability and overall effectiveness. The use of directed nets eliminated redundancy and kept third parties informed of events without clogging private lines.

Many lessons were learned by all concerned during the six days of total paralysis wrought by the devil storm. Yes, communications techniques still need polishing and refinement, but the spirit, dedication and skill of New England amateur radio operators was proven again to be a priceless national resource.

2500 Mile SOS

With a little help from a dentist in Sudbury, Massachu-

setts, Dr. John Wilson and Dr. Laurence Schacht put their heads together on March 22, 1978, and helped save the life of a thirty-three-year-old man who had gone into cardiac arrest.

But it was not just an ordinary hospital conference. The two physicians were 2,500 miles apart — Wilson in the emergency room of the Massachusetts General Hospital in Boston and Schacht in a remote missionary village a hundred miles down the Barama River in Guyana, South America, a twelve-year-old republic bordering Venezuela on the Atlantic Ocean.

Dr. Donald Sherman, WA1OEJ, of Sudbury, a local dentist with degrees from Brandeis and Harvard School of Dental Medicine, was the linchpin in this transcontinental rescue attempt which was channeled from Guyana, formerly British Guiana, through Boca Raton, Florida, to Sudbury, and, finally, to Boston and back again.

The incident began when Dr. Schacht, a general physician at the People's Christian Church Mission Village in Guyana, sought the advice of a cardiologist for follow-up treatment for a heart attack victim.

Lacking accessible medical experts in the equatorial lowland, Dr. Schacht, a member of the MARCO (Medical Amateur Radio Council) amateur radio network, contacted Walter H. Thain, a medical technician and co-member in Boca Raton, and requested the aid of a cardiologist.

Hearing Dr. Schacht's SOS on his own radio, Dr. Sherman quickly joined the transmission and said he could help.

He phoned Massachusetts General Hospital's Dr. Wilson, the resident on duty in the emergency room and through a phone patch Wilson conversed — through Dr. Sherman — to Dr. Schacht in South America.

"Dr. Wilson advised Dr. Schacht on appropriate medication and treatment," Dr. Sherman said. "The patient had a very irregular heartbeat and some other problems, but Dr. Schacht said Wilson's assistance will enable him to treat the patient properly, and he's hopeful the patient will recover."

Dr. Sherman described the MARCO network as a group of radio operators with degrees in various medical fields. Sherman said that some 800 MARCO members around the world meet at various times on their own radio frequency and assist one another in handling medical emergencies. Their sessions range from state-to-state powwows to arranging

medical supply deliveries overseas.

Field Day Surprise

WD8CPN and W8TN had set up in the Jackson County, West Virginia airport for Field Day, and were still going strong at 4:00 a.m. when they heard an airplane circling the darkened field. After attracting the pilot's attention with a flashlight Clark, W8TN, was able to contact him by using the radio in a parked aircraft. He learned that the pilot had tried unsuccessfully to activate the field's radio-controlled runway lights. They were down due to construction damage a week earlier. The two amateurs then positioned cars at opposite ends of the runway with their headlights on, and after making an exploratory pass, the pilot landed safely.

Amateurs Help Crusade

Reprinted from *Worldradio News*

In April, 1978, Ed Hudgens, WB4RHQ, was contacted by Dick Gavigan of the Memphis Crusade Staff to determine if the Memphis amateur radio operators could assist them in the production of an eight day crusade for Dr. Billy Graham. Through announcements made by the Wednesday evening Mid-South Public Service Net on 146.34/.94, a group of twenty amateurs were pulled together.

The initial purpose for requesting the assistance of the amateurs was to elicit their help in effectively overseeing the filling of the stadium and in keeping the crowd moving freely. These tasks were accomplished. However, they turned out to be only two of the many services the Memphis amateurs provided before the crusade was over.

About 10:00 a.m. on Sunday, May 7, a very severe storm system began developing in Texas and western Arkansas. This system was moving straight for the Memphis area. By noon the Crusade staff had contacted Brian Peters, WD4EPR, at the National Weather Service office. The decision was made to move the opening session to the Mid-South Coliseum which holds only 12,600 compared to the 55,000 seat stadium. Also the starting time was moved ahead one hour in an effort to outrun the storm.

With this, we almost had to throw all our plans out the

Replica of a typical 1925 amateur store in the Antique Wireless Association Museum.

window and start again. After some frantic moments, we managed to assemble a crew and work out a new plan for the Coliseum. At the same time, the Crusade staff was busy trying to make the general public aware of the change.

As the afternoon wore on and the people began to arrive, and arrive and arrive it became obvious that the site would be too small. With an hour left before starting time the Coliseum was filled and, indeed, overflowing.

By this time the storm was no longer a threat, and we had to lock all the doors to the building and turn thousands away. A decision was made to hold two sessions, one in the Coliseum and one in the stadium. A crew of operators was dispatched to the stadium to provide communications there.

The staff found that they needed constant communications to handle many problems: emergency messages; crowd control; assistance in searching for lost children and adults; material disposal; removal of drunks, troublemakers and others from the premises; and security for Dr. Graham.

Dr. Graham has no special immunity to the problems that plague famous people; several threats against his life were received. Luckily, no trouble developed, and none of

the crowd was aware of what was going on.

On Saturday evening, the amateurs had their picture taken with Dr. Graham and he expressed his thanks for our assistance and spoke very highly of radio amateurs in general.

Dr. Graham's personal staff was so impressed at how smoothly the Crusade was carried off with the help of ham radio that they requested the amateur radio operators in Toronto and Nashville be notified so that similar arrangements could be made for crusades in those cities. The Memphis ARES group hoped that this service might be continued for Dr. Graham as he holds his meetings across the United States and Canada.

No Phone

The call came a little before 12:30 a.m. on Thursday, June 15, 1978. "This is WB7CVM at Holden Village. We need a helicopter to take a woman with a heart attack to the hospital in Wenatchee immediately. We also need to talk to a doctor . . ."

The degree of urgency is better understood if you realize that Holden Village is two-thousand feet up in the Cascade Moutains of Washington, ten miles from the shore of Lake Chelan. You can get there on the scenic tour boat *Lady of the Lake* which carries tourists up from the town of Chelan, forty miles to the south.

Holden used to be a mining town (gold, copper) but it was abandoned in 1957 by the Howe Sound Mining Company. The buildings were purchased by the Lutheran church in 1960 and by 1963 had been turned into a retreat center. About 5,500 people yearly attend lectures, seminars, study groups and take hikes in the surrounding wilderness.

The nearest telephone is twenty miles or so distant. There is no road connection. The only communication with "the outside" is by amateur radio.

Keith Olson, W7FS, in Balfair, across the Cascade Mountains from Werner Janssen, WB7CVM, heard the emergency call. Like most other amateurs using the 4 MHz band in the Pacific Northwest, he was listening on 3970 kHz. For years that frequency has been used for contact. It is used by two daytime and two evening nets. Since July 15, 1971, NAMS (the Northwest Amateur Monitoring Service) has

occupied it throughout the day.

W7FS to WB7CVM: "Where is the nearest helicopter located? I can call it for you."

Werner did not have a telephone number, but he had the name of a helicopter firm in Cashmere, a few miles from Wenatchee and the hospital.

Keith dialed directory assistance, got the number of Cascade Helicopters, dialed it, and within minutes a whirlybird was on its way to Holden Village — thirty-five miles away as helicopters fly.

So far, so good. But the nurse at the retreat center — Nadeen Kams — wanted expert advice on how to treat the patient, Gertrude Lundholm of Rock Island, Illinois.

"She's not doing so well," said Werner. "We want to talk to a doctor in Wenatchee."

At this point Fern Fletcher, K7MCA, in Aberdeen stepped in. She called long distance to Albert Freeman, W7ETO, in Wenatchee to tell him he was needed. Al put Dr. Carl Kajbech on a phone patch and he talked to Nadeen Kams.

"Mrs. Lundholm is having difficulty breathing," came the report. "She is cyanotic (turning blue) . . ."

The doctor gave instructions for treatment. The helicopter arrived, Mrs. Lundholm was put aboard and was transported to the hospital in Wenatchee. She arrived there in less than an hour after the emergency call went out from WB7CVM.

Mrs. Lundholm's problem was congestive heart failure, brought on by maladjustment in medication which had recently been prescribed for her heart condition. It could have been fatal. Thanks to amateur radio, however, she was back at Holden Village in about a week and had resumed her activities there.

Earthquake Response Exercise

It's 7:30 a.m. on a workday. Dad is halfway to his San Francisco office from the family home located in a southwest area residential district. Mom is just pouring herself a second cup of coffee after having seen the kids off to school.

Without warning the street in front of Dad's bus starts to heave, crack and twist. The bus, out-of-control, rolls across the sidewalk and crashes through a metal fence in front of a

Victorian style home, coming to a final stop halfway into the basement. The silence is broken only by the moans of the injured and cries for help!

Back home, the stove tilts, the coffee pot slides to the floor which now leans at a crazy angle. Unable to keep her footing, Mom falls, as plaster showers down and furniture slides over the floor, coming to a rest against a wall.

The kids, almost to school, are terrified as the sidewalk opens, closes and then buckles into a concrete jumble. Houses lean at a crazy angle. Bricks from chimneys litter yards. Where some houses have not completely collapsed, fronts and sides peel away, leaving interiors with frightened and injured occupants exposed!

Farfetched? Not really. An earthquake of similar magnitude (8.3 on the Richter scale) has struck somewhere along the San Andreas Fault, which runs through western San Francisco northward out to sea and southeasterly into the Gulf of California, on an average of once every seventy years since recorded history began in California.

In 1972, the National Oceanic and Atmospheric Administration (NOAA) completed a study of the effects of a Richter 8.3 quake occurring on the San Andreas or Hayward Faults. Some of the study's conclusion were that a quake happening at the beginning or end of a workday would result in 10,360 dead, 40,360 injured and between 33,200 and 36,400 homeless.

Additionally, there would be a loss of fifty percent of all hospital beds; twenty-five percent of the freeways would be impassable; U.S. 101 south of San Francisco would be under water; major bridges would be closed indefinitely; railroads and local airports would be out of commission for varying periods; water supplies would be cut fifty percent; electric power would be disrupted, as would natural gas; major problems would occur in sewage control; all lines bringing petroleum into the Bay Area would be broken with a serious threat of fire; all radio and TV facilities would be off the air for at least twenty-four hours; and with electric power having been cut to most homes, battery powered radios would be needed for news dissemination.

At least fifty percent of telephone communication would be out of service indefinitely and twenty-five percent of all San Francisco fire stations would receive significant

damage, with the problem compounded by blocked streets, ruptured water lines and poor communications.

The California State Department of Health would be a lead agency for the amelioration of medical, environmental health and emergency welfare services. It would bear the responsibility for the coordination of such state level services as food and drug safety, radiologic health, sanitary engineering, vector control and waste management, bioenvironmental and biomedical laboratory services, emergency medical services, infectious disease control, state mental hospitals and services.

In addition, it would have to coordinate the operation of congregate care centers for refugees; inquiry services for separated families, relatives and friends; and special emergency welfare services for the aged, blind, disabled and children. The department would face a massive task.

These problems would be greatly compounded by the NOAA projection that fifty percent or more of telephone service would be out indefinitely. Phones in service would, on the basis of past experience, be in such heavy use by survivors and others that for all practical purposes there would be no telephone service! Without prompt, accurate and efficient communications, it would be an impossibility for the Department of Health to fulfill its emergency missions.

Following the earthquake which struck near the town of Oroville some seventy miles northeast of Sacramento, state health officials found that, although landlines were not down and were operative, they were so much in use it was impossible for some time afterwards to contact the quake area.

A suggestion to State Health and Welfare Agency Secretary Mario Obledo led to the implementation of an emergency amateur radio station at the department's Sacramento headquarters. By the end of 1975, WB6NFY was on the air. Since then the station and its volunteer staff of six amateur operators have kept emergency communications going when needed.

In addition to having what is probably the highest amateur antenna system in Sacramento, up some nineteen floors on the roof of a state office building, WB6NFY also has a 117 volt ac tie-in with two 150 kW (187.5 KVA), 226 amp 3 phase, 60 cycle diesel powered generators which

would normally power the emergency lighting and elevator systems in the building where WB6NFY is located. There is usually sufficient diesel fuel on hand to run the generator for about six weeks without a new supply of oil.

Communications division technicians of the State Department of General Services are presently installing an all HF band inverted "V" running northwest to southeast. With a radiation pattern off the ends of the wire, more efficient coverage of the state from Sacramento should be assured.

Terremoto Ayuda

It was 4:24 a.m. February 4, 1976. I had just finished running phone patches for the Coast Guard icebreaker *Glacier* in Antarctic waters and was idly ragchewing with Ed Dougil, W5VVP — ex-K7PPQ — in Las Cruces, New Mexico, and talking of going to bed. Suddenly there was a call, "Break, break, break — Terremoto Ayuda." I answered the call and said, "Go ahead breaker." He replied, "There has been an earthquake — thousands killed. Notify the Red Cross." Terremoto Ayuda means, "Earthquake, Help."

Doug's signal in Guatemala, on his phased vertical array I had designed for him for Antarctic traffic, was stronger than mine. He also had Spanish-speaking people available, so he took over while I called the Ohio Attorney General to notify the Red Cross, the Disaster Services Agency Director, Raldon M. Smith, and the Associated Press in Columbus, Ohio.

Doug called the Washington office of the Red Cross and the State Department. The first reaction of the Red Cross was, "It is probably a simulation drill." It took some time to convince them. Doug finally got a phone line into Guatemala City and connected a Spanish-speaking Las Cruces operator with an operator in Guatemala City via phone patch. The Guatemala operator confirmed that there had been an earthquake. The Red Cross called back with an apology and then swung into action.

The ham in Guatemala was Carlos Penoto, TG9CP, manager of a radio station, and the chief of communications for Guatemala. He had an emergency generator for his amateur radio station.

The quake measured 7.5 on the Richter scale, and for

many days after-shocks rolled through the country collapsing buildings weakened by the first shock. Roads and all communications to the interior had been knocked out, and there was some time before the extent of damage was known.

"Fifty percent of the buildings are down," Carlos said. "We have no electricity, no communication, and the one local radio station is operating on batteries. We know that the quake has also hit three other countries — Mexico, Honduras and El Salvador.

"The initial reports of casualties were about 1200 to 1500. It hit hardest in the poor areas. About a hundred miles west of Guatemala City, in Quezaltenango, there is total destruction. St. Augustine is demolished as well as Saragossa, Comalapa, and San Arate. The domes on the cathedrals here in Guatemala City are down. There is an average of 100–150 dead in each city.

"We still don't have any radio communications, telephones or water, and we need medicines." Carlos concluded.

Our frequency on 40m attracted a lot of attention. Soon amateurs all over the country had responded, and had set up nets to handle health and welfare messages with a couple of stations in Guatemala.

As more stations checked into the various emergency nets, round-the-clock amateur communications began. Agencies with radio capabilities, such as the Hall of Science radio station in New York City, were beseiged with thousands of calls from people inquiring about relatives or friends in the disaster area. Soon nearly 100 messages a day were being received; over all about 300 a day were being filed for transmission. The Hall of Science operates amateur radio station WB2JSM as an exhibit demonstrating to the public, and permitting many to talk to people in foreign countries as well as in the United States.

Millions of people have visited the Hall of Science and have seen WB2JSM on the air. Newspapers and television stations ran stories about the Hall of Science station that brought in more inquiries. New Yorkers overwhelmed the telephones at the Red Cross headquarters and the Guatemalan desk at the State Department, but to no avail.

Because there were only about five Guatemalan stations to receive traffic, it was decided to send the messages by radio to Florida, where shipment was made to Guatemala

by Pan American Airways. Approximately 600–700 messages a day were transmitted in this way.

Reports from the earthquake zone now estimated that 25,000 people were dead and 1,000,000 homeless in the freezing February weather. The wife of the President of Guatemala took personal responsibility for the displaced children.

Bulldozers sealed over mass graves filled with quake victims so the nation could turn to the urgent task of saving the injured and finding shelter for hundreds of thousands of homeless. Whole towns had been reduced to rubble and survivors were still being rushed to the capital by helicopters and ambulances.

At Guatemala City General Hospital the chief of surgery said that beds were being moved to outside patios for fear the hospital roof might cave in. A makeshift tent became the hospital's emergency room.

The United States, Peru, Venezuela, Nicaragua, El Salvador and Honduras all rushed relief supplies to the stricken country. United States aid included a team of twenty-five physicians and equipment to set up a 100-bed hospital, along with plasma and much-needed drugs.

The government appealed to food stores to reopen to supply thousands of homeless still camping out in streets and parks. It warned that those stores hoarding food or jacking up prices would be severely punished. Government employees were asked to return to work and a few businesses, gasoline stations and shops were open and there was traffic in the streets.

In the capital water was restored to about twenty-five percent of the city. Most electricity was restored, although sometimes with emergency generators.

The hardest hit areas were outlying towns where the quake leveled adobe homes. The village of Parramos, about thirty-seven miles west of the capital, was destroyed. When the doctors arrived there they said, "We cannot see anything but rubble. We don't know if the people were buried down there or if they were evacuated."

The Vice Minister of Public Works said the roads leading to the country's Atlantic coast were still impassible, but work was moving swiftly on reopening the main gateway to the Pacific. The heavy damage along the Atlantic route would

delay delivery of gasoline to the capital and the government urged citizens to ration fuel.

Amateur communications networks all over the country were set up on both 40m and 20m. Many amateur radio clubs mobilized to collect food, money and clothing for the earthquake victims. Announcements would be made by the broadcast stations and the amateurs would pick up donations and deliver them to the Red Cross. There is an understanding between the American Red Cross and the ARRL that amateur radio operators play a voluntary role as part of the Red Cross disaster service.

The R. L. Drake Company sent radio equipment; many 2m FM sets and a repeater were rushed by Red Cross plane to the disaster area. The media was generous in its praise of amateur radio's role in this operation.

LA Amateurs Help Ecuadorian Boy

Reprinted from *Worldradio*

One night in early October 1978, a radio message was relayed from Ecuador to the United States and picked up by amateur operators in southern California. The message was brief but urgent. A ten-year-old boy, Paulino Freire, had a tumor of the pharynx growing in the back of his throat and impairing his breathing according to Frank Arturo Gangotena, HC1AG, in Quito.

The boy was in desperate need of an operation, but no doctor in his country could perform the surgery and his poverty-stricken parents had no means to get him to a country that could perform the operation.

Ted S. Henry, W6YEY/W6TOG, learned of the situation and appealed to Dr. Gerald Blankfort, who immediately took on the project.

After many days of plowing through red tape of various official agencies, Blankfort finally arranged for the mother to bring her boy to Los Angeles. He secured a top surgeon specialist to schedule the surgery at UCLA Medical Center, free of charge.

The boy, who spoke no English, arrived with his mother. They were met at the airport by a group of amateurs who had raised $5000 to pay Paulino's travel and hospital expenses.

A large portion of the hospital bill was picked up by the UCLA Alumni Association.

"It was a very touching experience," Dr. Blankfort said. "He was dressed in his Sunday best. He put a medallion around my neck and embraced me. Then in his little voice he said, "Gracias, Senor, gracias. It was one of the most emotional experiences of my life."

After the operation Paulino stayed with an East Los Angeles couple while he recuperated. When he finally left for Ecuador he took with him a gift from Dr. Blankfort, an amateur radio of his own.

"We want to do it so he can always remember it was because of ham radio that we were able to do this for him," Blankfort said. "Then some day he may be able to help someone in the same way."

3

Antarctica: Tales from the Last Frontier

If all the snow and ice in the entire Arctic region were combined with all the snow and ice in Alaska, Canada, Siberia and all the ski resorts in the world it would total only five percent of the snow and ice on earth. The other ninety-five percent is in Antarctica, and is piled nearly two miles high. If all of this snow and ice were to melt it would raise the levels of the oceans by 200-250 feet. The Statue of Liberty would be up to her nose in water, and the United States Atlantic coastline would start in the middle of Pennsylvania. Thirty of the world's fifty largest cities would be under water.

The nations of the world deal with Antarctica the same as they do the moon, by international law. NASA used it as a laboratory because of its similarity to the moon and other planets. It is easier to understand if we think of it as another planet — a small piece of outer space between here and the moon. It can be reached from the rest of the world but six months of the year, and even then only by expeditionary effort. It has no native human beings; it is inhabited only by explorers — visitors who stay there for a few weeks, months or at the most, a year.

The thought of -126°F temperatures and 200 mph winds is incomprehensible to those of us who shiver in -20°F weather or who dread 75 mph hurricanes.

The ancient Greeks believed there was a great southern continent, and the New Zealand Maoris had legends telling

of a great white land to the south. But it took an 1839 U.S. Navy expedition, under the command of Lt. Charles Wilkes, to return to tell the world of the massive Antarctic continent.

The next event in the history of Antarctica's discovery was the ghost-like reappearance of two ships under the command of Capt. Dumont D'Urville of the French Navy. These ships, which had left France almost three years previously, returned home after charting a large portion of the coastline. Thousands of penguins and many square miles of snow and ice still bear the name of d'Urville's wife Adelie.

Wilkes' and d'Urville's reports of explorations had a great effect on the exploratory tactics of the British Navy's James Clark Ross. Using ice-strengthened ships, Ross plunged boldly ahead into the ice pack. He didn't stop until he reached the giant cliffs of the vast ice shelf which today bears his name. He also sighted 13,000 foot Mt. Erebus, the world's southernmost active volcano, just a short distance from where the Deep Freeze Capital, McMurdo Station, now stands.

In 1901, German, Swedish, and British expeditions took to the field. All had their exciting moments. The Germans' ship was frozen in the ice within sight of their goal and drifted with the pack for a year. The Swedes, on the other hand, made shore, but their relief ship was crushed, leaving both the wintering-over party and the ship's company to make out as best they could. These men proved it was possible to live from what they could find in the Antarctic. A diet of seal and penguin, however, soon became monotonous. They remained in the area for two years until an Argentine naval vessel came to their rescue.

The most far-reaching of the early scientific probings in Antarctica was that of the British National Antarctic Expedition of 1901-04. Commanded by Capt. Robert Falcon Scott, they built a base at Hut Point, McMurdo Sound. Their hut stands today, adjacent to the Navy's McMurdo Station. I have pictures of the hut and the inside is just as Scott left it, including boxes of food packed "for expedition use." The cold dry air has preserved it all these years. By the time Capt. Scott left the area in 1904, his scientists, together with those from Germany and Sweden, had collected enough information to put Antarctic studies on a sound basis.

McMurdo Station, Antarctica from Ross Ice Shelf, with Mt. Erebus in background—an active volcano with constant smoke plume.

Also during this period, Lt. Ernest Shackleton led a British team on an assault of the South Pole itself. They crossed the great Ross ice shelf, climbed the mighty glaciers, forged over the Polar Plateau, and reached a point about a hundred miles from the geographic South Pole, before they were forced to return in the face of the oncoming winter.

Amundsen Reaches the Pole

Both victory and tragedy marked the race to the South Pole between Norway's Roald Amundsen and Britain's Capt. Scott. Amundsen launched his assault from the Bay of Whales at the eastern side of the Ross Ice Shelf. His reliance on time-tested sled dogs enabled him to reach the geographic South Pole within two months. Final victory occurred on December 14, 1911. After three days of checking and rechecking his position, Amundsen returned to the Bay of Whales and sailed for Norway.

Capt. Scott, however, was not so fortunate. After an abortive attempt at mechanized transport, he resigned his

fate to a team of Siberian ponies. One by one the ponies died, and Scott's men were forced to take on the additional burden. Scott reached the Pole only a month after the Norwegian, and was stunned to find Amundsen's flag flying above the spot he had struggled so long to attain. On the return trip to their McMurdo camp, they grew weaker each day. One of Scott's party, feeling himself too weak to keep up, wandered out into a blizzard and died alone. Capt. Scott and his two remaining men were found by a relief party in the spring, huddled in death amid their papers and rock samples. Despite cold, hunger and weakness they elected to carry these scientific observations to their death. Scott's second expedition had followed in the tradition of his first — a triumph for science.

In 1914, Sir Ernest Shackleton returned to Antarctica to attempt the most ambitious exploratory venture in history. He was to cross the continent from the Weddell Sea to the Ross Sea by way of the South Pole. A support party would lay supply depots of food and fuel across the four-hundred miles of the Ross Ice Shelf.

A Quonset building with a church front for services at McMurdo Station.

Crushed by the ice packs before reaching the continent, Shackleton's ship sank and the crew took to the pack. The supply party ship drifted away from the Ross Sea Party leaving those men to carry out their task under great difficulties. Shackleton's party came through their two year struggle without a single casualty, though the support party suffered three losses before they were rescued. This story of adventure ranks with the all-time heroic stories of Antarctic exploration.

During the years 1928-1955 Admiral Byrd's expeditions dominated the Antarctic scene. His first in 1928-1930 included the premier flight over the South Pole. During his second expedition, 1933-1935 he wintered over alone, farther south than any man had ever wintered before.

Desolate Continent

The Antarctic at the bottom of the world is very different from the Arctic at the top of the world. The area around the North Pole is water — a frozen ocean surrounded by land. Our nuclear submarines have sailed under the ice at the North Pole. The Antarctic, however, is a continent of land larger than the United States and Mexico combined, completely surrounded by water. Over the centuries the ice has piled up to form a huge ice cap covering ninety-five percent of the continent. Yet, with all that frozen water in the form of snow and ice, the Antarctic is actually a desert — a dry continent with almost no moisture at all. It is the highest, coldest, driest and most desolate area on earth.

Although the human race has lived on the other six continents for ages, it has kept a foothold on the seventh continent for only a score of years — a time well within the memory of a majority of Americans.

For some reason this continent is not even listed in the WAC (Worked All Continents) award by ARRL. I suppose it is because it has no government of its own, although it certainly is a continent, and a large one.

The last of the U. S. pre-World War II expeditions, and the first official expedition since the nineteenth century Wilkes expedition, was the U. S. Antarctic Service Expedition, 1939-1941, led by Byrd and strongly supported and followed by President Franklin D. Roosevelt. Four airplanes were used by that expedition.

Post-War Expeditions

Much of the success of the U. S. program of exploration and scientific investigation in Antarctica since World War II is attributable to the mobility provided by aviation. The use of fixed-wing airplanes and helicopters enables explorers and scientists to expand their horizons while compressing the time required to investigate new areas and to get to existing stations, especially inland.

This contribution, however, has not been without significant losses. Since the beginning of Operation Highjump, in 1946, forty U. S. scientists and support personnel have died in Antarctica; twenty-nine of them died in aircraft accidents. In all, twenty helicopters and thirty fixed-wing airplanes have been destroyed while flying in support of U. S. Antarctic programs.

Operation Highjump, 1946–1947, remains the largest expedition ever sent to Antarctica by any nation. It consisted of 4,700 men, 19 airplanes, 7 helicopters, and 13 ships. The expedition's objectives were to train personnel and test equipment under Antarctic conditions; consolidate and extend the basis for U. S. claims in Antarctica, should claims ever be made; investigate problems in the selection of base sites and in their establishment, maintenance and use; develop techniques for the establishment, maintenance, and use of air operations facilities on ice; extend the knowledge of hydrography, geography, geology, meterology, and electromagnetic propagation in Antarctica; and supplement the Navy's Operation Nanook in the Arctic in 1946.

The expedition accomplished most of its objectives. Icebreakers, used for the first time in Antarctica, were especially successful. Some 1.5 million square miles of the continent were seen, almost half for the first time, and about 15,000 aerial trimetrogon photographs were taken. Aircraft, fitted with both skis and wheels, flew to a continental station from an aircraft carrier. Weather observations, which increased the knowledge of Antarctic weather processes, were sufficient for twice-daily weather maps. About 70,000 aerial reconnaissance photographs were taken during 64 flights. At least 18 new mountain ranges were discovered and two ice-free areas near the Indian Ocean were photographed.

Several pieces of World War II military equipment were

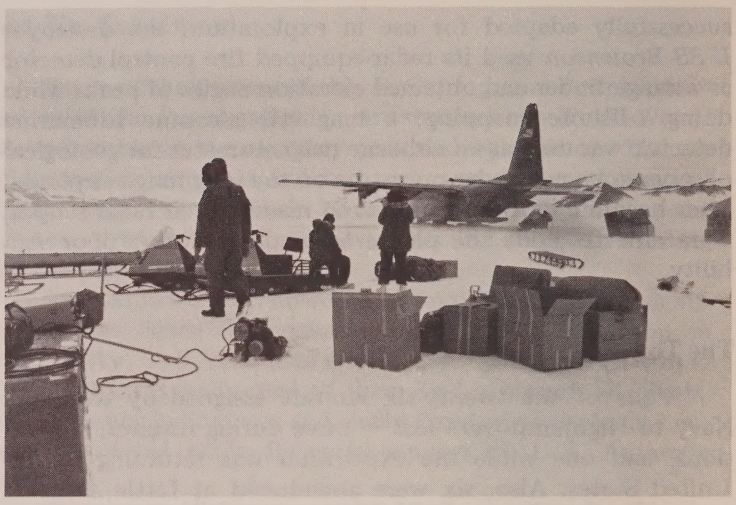
successfully adapted for use in exploration; the destroyer *U SS Brownson* used its radar-equipped fire control detector as a range finder and obtained elevation angles of peaks while doing offshore mapping; a magnetic airborne submarine detector was used as an airborne magnetometer for geological observations; and radar operators on the long range airplanes, after becoming more proficient in reading their radar scopes, were able to guide the planes to landings during poor visibility.

The Toll

Four of the twenty-six aircraft assigned by the U.S. Navy to Highjump were lost — three during Antarctic operations, and one while the expedition was returning to the United States. Also, six were abandoned at Little America and later went out to sea when the ice shelf calved.

The first loss was a PBM-5 Martin Mariner. The seaplane departed its tender, *USS Pine Island*, on December 30, 1946, for photographic reconnaissance over the continent.

The ice breaker Glacier anchored off Palmer Station, Antarctica. Official U.S. Navy photo by Doug Nortell.



McGregor Glacier base camp 450 miles from McMurdo Station, Antarctica. Official U.S. Navy photo by John Collinson.

During the flight south the weather began to deteriorate. After three hours of flight the plane was in sight of the continent, but by then the ceiling was down to 500-1,000 feet with the sky completely overcast. Visibility was less than two miles. The PBM-5 entered a whiteout and shortly thereafter *Pine Island* lost radio contact.

As the PBM-5 reached the coast, under poor conditions, Lt. (j.g.) William H. Kearns, Jr., the copilot, took control of the plane from the pilot, Lt. (j.g.) Ralph Paul LeBlanc, and climbed to 1,000 feet. The plane was sluggish due to icing, and the altimeters registered inconsistently. Ahead, the crew saw land rising into the overcast. Kearns decided to turn back and made a shallow left turn. There was a crunching sound and a sharp jolt as the plane's hull scraped the surface. The plane bounced into the air. Kearns pulled more to the left and increased power to full throttle, but in an instant the plane exploded and crashed on Thurston Island. Everyone but LeBlanc was thrown clear. Kearns, in spite of a broken arm, managed to rescue the unconscious LeBlanc from the burning PBM. Killed in the crash were Ensign Maxwell A. Lopez, navigator, and Petty Officer Wendell K. Hendersin,

radio operator. Two hours after the crash Petty Officer Frederick Williams, engineer, also died. Survivors other than LeBlanc and Kearns were Petty Officer Owen McCaety, photographer, Petty Officer William Warr, mechanic, Petty Officer James Robbins, radio operator, and Captain Henry H. Caldwell, captain of the *Pine Island*, an observer on the flight. The dead were buried at the crash site.

When the Mariner became overdue search or rescue was impossible because of the weather. The first search flight could not be launched until the evening of January 5, 1947. It returned a few hours later when weather closed in to the south. The same happened on the following four days.

Searching for better weather, Capt. George Dufek, commander of the eastern group of Operation Highjump ordered *Pine Island* westward. On January 11, a flight was launched and the survivors were spotted while the search plane was returning to the ship. A message was dropped to the survivors informing them that open water was ten miles to the north. When the survivors signaled they could walk that far, the search crew dropped flags to mark the way, and then returned to the ship to refuel. Later the crew of the *Pine Island* met them at the coast and helped them out through deep snow.

This is typical of the aviation accidents which took many aircraft out of service and killed some of the men.

Nations Cooperate

The oddest thing about the Antarctic, among the myriad of odd things, is that a human can live there at all. The weather and the terrain are so fierce that, on a summer day, any lone person can be sucked into oblivion. The continent has been covered with ice for eleven million years and, as has previously been mentioned, not until 1957 did anyone spend a winter at the South Pole. In the years since then, facilities have been built up so carefully that a person can live almost in comfort while devoting full attention to the bottom of the sea or the upper atmosphere. The scientific knowledge thus gained is already worth many times the original cost.

Each year, in the austral summer, the United States Navy sends a large force to the Antarctic in support of

150-200 scientists. Operation Deep Freeze manages to keep about ten ships and nearly two dozen aircraft operating in the coldest temperatures on earth. About two-hundred Navy men spent the winter in 1966 — four to six months of it in darkness — to enable thirty-six scientists to maintain the continuity of their observations.

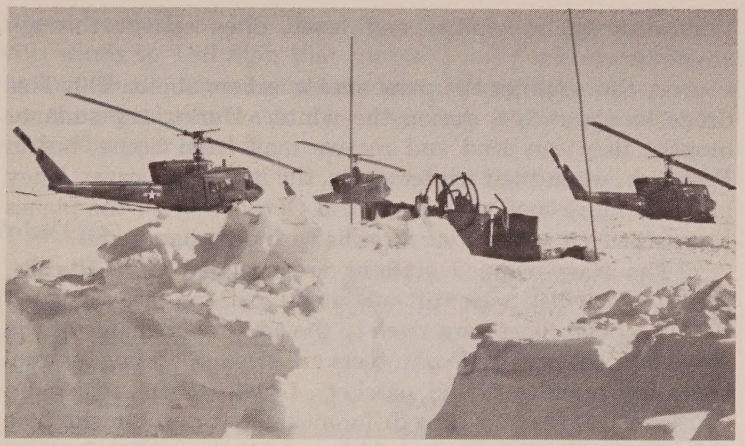
The scientist's measurements may not be analyzed for a year or more, but there is satisfaction in knowing the experiments may benefit the entire world. Following the practice begun during the International Geophysical Year, 1957-1958, scientific information is freely exchanged among all those nations with Antarctic bases. This unprecedented cooperation multiplies the quantity of data available to each investigator.

The National Science Foundation offers about $7.5 million annually in grants. The scientist, and sponsoring university, tells the U. S. Antarctic Research Program (USARP) what is needed, down to the smallest net or coil of wire, and USARP discusses the logistic requirements with the Navy. The "lead time" is often as much as a year, since the project must be coordinated with others and all equipment must be delivered in the field together — at the end of the world's longest supply line.

The weather still makes most of the decisions in Antarctica. In order to overcome it, with machinery that must be maintained thousands of miles from home, the Navy has become ingenious at making the most out of a limited amount of equipment. Deep Freeze probably gets as much for its money as any command in the armed forces.

Deep Freeze is the Navy's "blue chip" duty — not because it is easy, but because of the caliber of personnel. When it began, there were sixteen volunteers for each opening, and even today reenlistment remains high. They are attracted to the ice for a variety of reasons, among them, adventure and the feeling of being in on something important.

Since most personnel are selected for Deep Freeze on the basis of their individual skills, they discover, once they arrive on the ice, that they are indispensable. They feel personally responsible for their small units, and take pride in producing or repairing something essential to many other people. The harshness of the environment, the loneliness, and the long hours are relieved by close companionship and a



Helicopters at refueling stop.

rich humor. This humor hides seriousness and genuine idealism.

Like the support forces of other nations, the Navy offers assistance to anyone who requires it, whether to a Russian aircraft, an Argentine traverse party, or a New Zealander studying penguins. Dr. Henry M. Dater, the staff historian of Deep Freeze, says this attitude comes from "the ancient tradition of the sea of giving help to ships in distress, and the feeling of polar explorers that, where nature is implacable, man had better unite for his own survival." As a precedent for world behavior, this arrangement in the Antarctic, extended by treaty for thirty years, may turn out to be historic.

On the ice, space and time are not what they seem. An aircraft leaves McMurdo today and arrives at Byrd Station yesterday. Distances are distorted, mountains are actually farther away than they look, and the ground — in some weather — is closer. The latest communications equipment can detect clues to the geology of three hundred million years ago.

The Role of Ham Radio

Those in the Antarctic are without voice communica-

tion with their families and loved ones except through amateur radio.

In the summer the personnel numbers about 400. This drops to about 150 during the winter. During the summer months they can send and receive mail from home, but in February, when their winter starts, the last plane leaves. They have no more mail packages until October when the planes fly again. That means nine months with only ham radio.

The Navy-manned stations are assigned KC4US calls, and the civilian scientist-operated stations are assigned KC4 AA calls. These are given to the admiral in charge of the Antarctic stations, and volunteers are given operating instructions for running phone patches. Usually there is a radio contingent of seven, with a different operator each night. The volunteers take this on in addition to their regular daytime duties. It gives them a chance to talk to the "real world" one night each week. There is no shortage of volunteers, who may be bulldozer operators, dentists, machinists, or cooks, and sometimes even real amateur radio operators. A Navy radio specialist checks them out and keeps the equipment in repair.

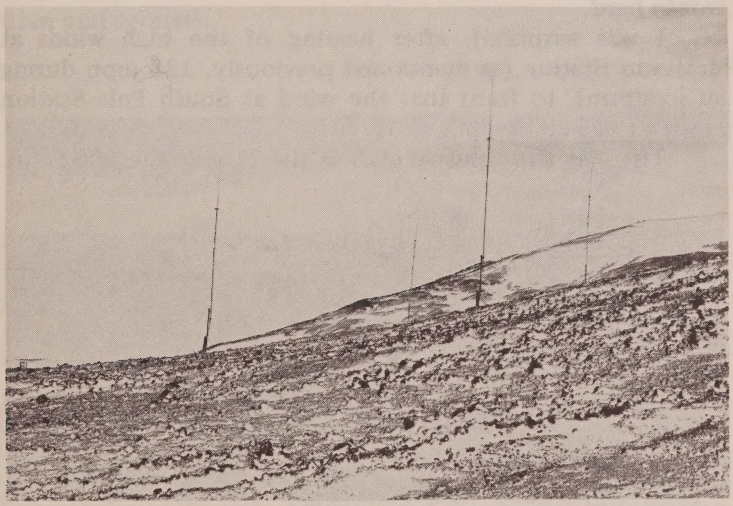
At McMurdo Station, I designed the array of four

Operating position at KC4USV ham shack on Ross Ice Shelf. Official U.S. Navy photo by Howard Weinger.

phased verticals in 1974, and it has withstood the icestorms with winds to 138 mph that tore two walls and the roof off the ham shack. They had used a two element 40m wire beam, but the signal was weak. The new array made it possible to work 40m year round.

Polar Life

For many years only rugged men have gone to the Ice, as the region is called by those who know it, but lately women have been going there. Six female scientists arrived in 1969, and in 1974, Dr. Mary Alice McWhinnie, a biologist from DePaul University, made history by wintering over at McMurdo Station as the station's scientific leader, along with fellow DePaul biologist, Sister Mary Odile Cahoon. They



The four phased vertical array designed by the author of this book in 1974. It fires across the Ross Sea to the States. The array is mounted on volcanic ash which is deposited on the Ross Ice Shelf. The ice is 34 feet down, and is 1000 feet thick, making an almost perfect ground plane. It has withstood 138 miles per hour ice storms. Each has 6 radials, with one on the south side and the other five fanned out on the other sides. All are guyed at the center. Official U.S. Navy photo by Howard Weinger.

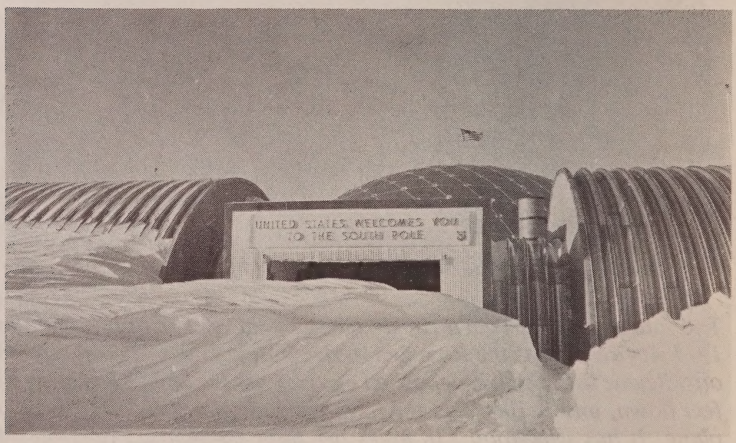
were the first women to winter over since 1947-1948, and only the third and fourth in history. It was my privilege to run some phone patches for Dr. McWhinnie during her stay there.

Antarctic life has been made easier during the twenty-three years since the International Geophysical Year, and at the South Pole a five-story high aluminum dome has been erected under which "buildings" are protected so that people can move around inside, sheltered from the wind and snow. The antennas, however, are still outside the dome, and even in the summer that is a cold place to work.

A South Pole operator told me one night that their 40m beam was loose, because the person who put up the 20m beam above it had forgotten to bolt it down. The 40m beam, spinning in the wind like a pinwheel, had broken the cable so they could not use it. He said that he had tried to climb the tower but had had to give it up because the top of his ear had frozen hard.

I was surprised, after hearing of the high winds at McMurdo Station (as mentioned previously, 138 mph during an icestorm), to learn that the wind at South Pole Station never exceeded 45 mph.

There is an exclusive club at the Pole — the 300 Club.



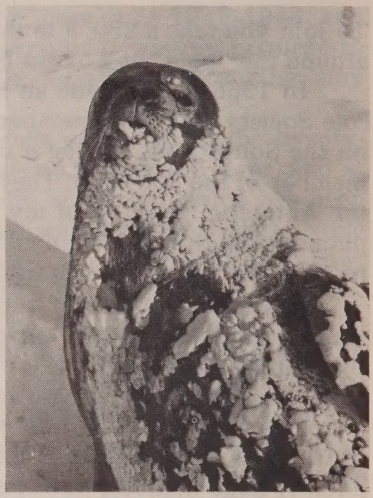
The new South Pole Station. All buildings are enclosed in a geodesic dome and steel arched tunnels for protection from the extreme cold.

To join you take a 250°F sauna bath, then run naked outside around the "pole" at a minus 50°F temperature.

In 1966, I was made an honorary member of the South Pole Society, the only member who had not actually set foot on the South Pole, and later on I was also made an honorary member of the 300 Club. They also named me "Godfather of the Antarctic" because of my nightly devotion, not only for phone patches, but for a much more highly prized activity — just keeping them in touch with the "real world."

Most people think of the duty there as depressing, but many volunteers go back again and again. They tell me that the solitude and quiet, where the only sounds are the wind and your own footsteps and heartbeat, give you such a feeling of security that you have real trouble facing the world of traffic jams, coats and ties, shaving and hair cuts, crisis headlines. A large number, however, count the hours and minutes until they leave. These are people with sorely missed children and spouses.

Harry Phillips backs away as Weddell seal tries to nip him. Professor Elmer Birney applies a tag to the seal's flipper. Ms. Jan Eldridge carries a string of tags. The tags help determine growth, population, reproduction and group movement habits. Official U.S. Navy photo by Doug Nortell.



Weddell seal captured by scientists from Massachusetts General Hospital for cardiovascular research. Official U.S. Navy photo by Richard Horton.

When the servicemen leave, however, they are usually given their choice of assignments, and for some reason they nearly always want to go to some warm country, such as Greece, California or Puerto Rico.

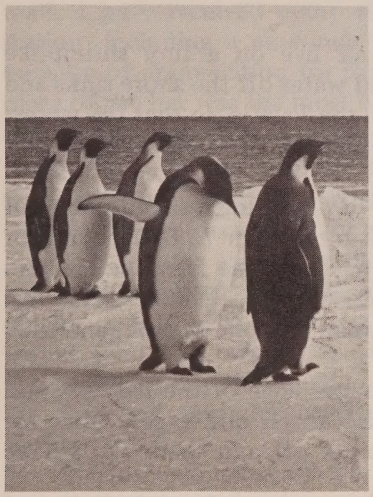
Mc Murdo and Palmer Stations are at sea level, and buildings there are built on the ground, which is permafrost to a depth of a thousand feet. These buildings are heavily insulated and covered with corrugated steel for protection against blowing snow and winds that exceed a hundred miles per hour.

The summer temperature at these stations is more moderate, and at Palmer Station it actually rains. When the rain freezes, though, it is a slippery place.

There is an active volcano at McMurdo Station called Mount Erebus, that displays a constant plume of smoke along the horizon.

The ice cover over the Ross Sea sometimes weakens in mild weather. A couple of years ago a vehicle carrying Doug De Master and several other young ecologists was crossing on the ice when it started to break through. Doug and two others jumped for their lives, but the driver, a graduate student, did not make it and went down with the vehicle in 300 feet of icy water. Neither man nor vehicle was found.

When an accident of this type occurs, all amateur com-



Emperor penguins at the edge of Ross Ice Shelf. Official U.S. Navy photo by Edward Whitton.

munication is blacked out until next-of-kin can be notified. When this happens, which is not often, we know something unusual has taken place.

It is estimated that there are 10,000,000 seals in Antarctica, and most are unafraid of man. Thousands of them have been tagged, and the men counting and checking seal holes in the ice sometimes break through and get a wet trouser leg.

When a one-ton seal is approached he just rolls over on his back and makes a yelping, barking sound as though you were beating him. Although the animal is quick moving, he can, if given a chance, tear your arm to shreds.

Nearby are dry valleys which amazed early explorers — deep U-shaped gorges devoid of ice and snow. They are surrounded by rugged peaks, between which are "hanging glaciers" that come part way down the valley wall, then just end, hanging above the canyon floor. The similarity of this landscape to that of Mars caused scientists to study this place in their Mars research. There are lichens here which are the only indigenous vegetation on Antarctica. There is no bacteria in Antarctica, and each year when a new crew comes in the men leaving come down with colds, since they have lost their immunity.

The only permanent residents are seals, penguins, sea birds and bodies of explorers who have died in their effort

to conquer the continent.

The birds and animals all live on a tiny shrimplike marine life called krill. The cold water off the shore sinks and thus pulls in warm water from the Pacific, so that the waters around the Antarctic contain one of the richest sources of marine life in the world.

One resident, a professor of physiology, spends much of his time fishing. He has caught more than 75,000 pounds of Antarctic cod in his research to determine how the fish can live in this semi-frozen state. Each year he smokes some fish and sends one over to the Russian station, Vostok, and they send back vodka.

Garbage is hauled out to the edge of the icepack, and when it breaks off its cargo is carried out to sea. Once for about two years it did not break off and there was a large accumulation.

Sewage is run into a large cavity in the ice, and when it is filled another one is opened up. It freezes, of course, and thus does not contaminate the waters.

On the hill, overlooking McMurdo station, is a desalinization plant, where drinking water is distilled from sea water. Two pipe lines run up the hill, one taking up salt water and the other bringing down fresh water.

In the interior of the continent, water is made by snow melters run by electricity from large Diesel generators. Fuel for these machines is stored in 25,000 gallon fuel bladders. The fuel is brought in by supply ships to McMurdo then flown to each station. All heat is electric heat, to avoid fire hazard. Cooking is also done by electricity.

Tales of Phone Patching

One of the treasured momentos of my years with the Antarctic phone patch traffic is a piece cut out of the "90° South Bar" in the recreation room of the old South Pole station. It is about two inches thick and six inches by twelve inches in size, and on one side my burned-in name and address with an eight cent postage stamp, and on the other side, "Greetings from the South Pole Gang" burned into the wood. Across this bar, they told me, had passed the drinks of most of the men with whom I had talked over the years. I am sure it is the heaviest "post card" ever sent via the U. S.

mail. I have received many souvenirs from the South Pole station, including a nine-inch silver plaque engraved with a message of appreciation for the many phone patches, but the piece of the bar was the most unusual.

I have also received over 2000 color slides from the Antarctic. I have given most of them away to other amateurs who were running traffic. Whenever a man would ask if there was anything he could do for me, I would say, "Yes, you can send me a color slide of you and the gang if you have an extra one." Often I would be sent a roll of exposed film which I would have processed, and after selecting a couple I would send the balance to the home address. I even have color slides from the Russian station at Vostok, brought to me personally by the American exchange scientist at the Russian station.

I have met many of the men when they came home, I have talked to their wives and families and listened to their troubles, and I have sent greeting cards for the men on birthdays and holidays. I have talked to more than 1200 people in Antarctica. This has been one of the great pleasures of ham radio for me.

A few years back, about 3:30 a.m., I was about to close down, but decided to take a turn down the band and look for any last minute developments. I heard McMurdo Station trying to get an Arkansas station to run a phone patch, but his signal was not patch quality there. I broke in with "W8HXR." He came back, "Oh, Jerry, I want to talk to you. Let's move up the band." He told me that a man at the station had received a message from the Navy that his wife was dying. She was in a hospital in Tyndall Air Force base. I couldn't call collect, but I called the hospital and asked for the doctor in charge of the case. He was asleep. I asked if Mrs. Barton was there. He said, "Yes, she was with us." I assumed that meant she had died, but did not ask. I asked him if any relatives were there, and he said they were somewhere in town, but he did not know where, and that he could not tell her husband anything. I called back to McMurdo and told them the news, and that the doctor would not talk to him via phone patch. Red Barton, the husband, asked me to relay information for his mother and to try his apartment and see if they were there. There is a phone line from the ham shack at McMurdo to "downtown," and it was almost

unusable. Everything had to be relayed through the ham shack. I was on the patch about an hour, with all the arrangements for the burial, and what to do about his car and the furnishings. His mother said all the bills had been paid, and she would put the furniture in storage. "Tell him we are all here, and everything will be taken care of. Jay (his wife) is still conscious, and so far cheerful. Ask him if there is any message." I asked, and back came the relay, "Tell her I love her." I never told him that he was too late.

When McMurdo KC4USV came up the next night, conditions were poor. The operator said, "Jerry, his wife died last night and I have an important message for you, but I don't want to go into it until we have a good circuit. Look for me tomorrow." I did, but in those days McMurdo was one of the weakest stations on the ice, and I never got to talk to him again, so I'll never know what the message was.

Dear John (Sam)

One incident in my phone patching gave me a certain amount of amusement, and yet it was very sad for one of the persons involved.

A Navy man named Sam was stationed at KC4USM, the "Radio Noise" station about 1¼ miles from Byrd station in the Antarctic. One night he called me with a plea for an immediate phone patch to Boulder, Colorado. The mail that had arrived just before the winter closed all flights to the Ice had brought him a letter from his fiance that really shook him up.

There was another man by the name of Frank, a good buddy of his, who had left with the summer crew on the first plane out. Sam had asked Frank to stop in Boulder to see his girl and deliver his messages of love. Frank, however, had liked the young lady himself, and after a quiet courtship they had become engaged. Frank was on the way to a new duty station in the Canary Islands. The girl, Alice, agreed to get married and go to the Canaries with him. She had written to Sam to tell him this.

Sam was desperate. He could not get any letters out for nine more months, and could not send tapes, either. During the patch he asked her to wait until he could get a tape to her, but she refused. She said, "You never asked me to marry

you, or I would have. You simply said you were going to the Antarctic and would see me in about a year. Frank and I get along much better than you and I, and we agree on many things. I am in love with Frank, and to wait on your letter would be useless."

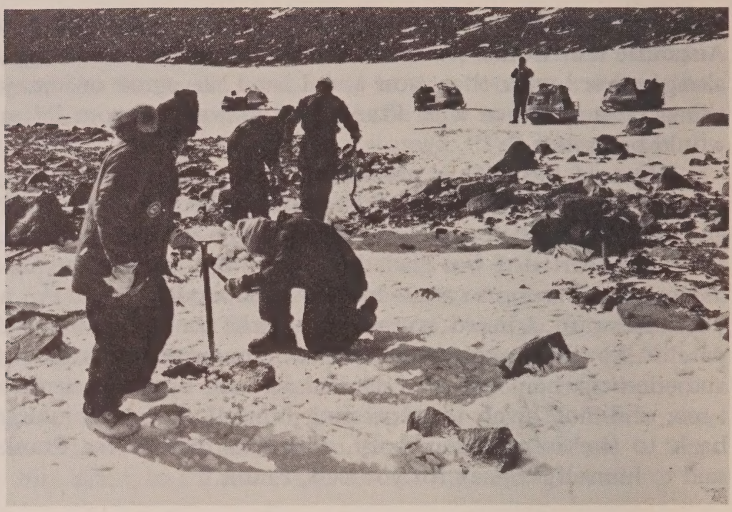
He told her he had great plans for them, and so forth, but she was firm and refused. The patch lasted about an hour and was one of the best I had ever run. Sam was appreciative, but downhearted. I was glad that he had not been in the predicament of having to argue his case with a poor signal. For a year afterward, I heard on-the-air remarks about Sam and his patch. We must have had one of the greatest listening audiences in ham history. He said he was a quiet scientist type, and not given to expressing himself. I kept thinking back to the John Alden story, with this difference: Frank said to himself, "Speak for yourself, Frank."

Sorry, Wrong Number

One of my more weird patches came one night on a call to Columbus, Ohio. I gave the operator the number and a man answered. I asked for Jean. He said, "Jean is not here any more. She married that guy over at Lancaster when her husband died. This is her father. Who did you say is calling?" I said, "It is her husband from Antarctica, South Pole." He replied, "Well, I'll be darned. I thought he was dead." I dropped the line for a moment and heard the man at the South Pole saying, "Jerry, you have the wrong number." I went back to the other man just in time to hear him say, "I'll tell her" and he hung up. I asked the operator to redial it, and found that she had misdialed the prefix. Chance had drawn another Jean's number at a different prefix than Columbus, in the wrong suburb. I still laugh when I think of her father telling her that her husband was not dead after all, but was at the South Pole. I had no idea which prefix I had actually been connected with, so I couldn't correct it.

Guessing Game

Once I had an experience that made me appreciate helpful telephone operators. I had a call to South Carolina, but got a wrong number. I had the operator redial it, but still got nowhere. I asked the operator to check the number of the



Making a snow road across a morine on a small glacier 450 miles from base camp, to facilitate the use of motor toboggans further into the valley. Official U.S. Navy photo by John Collinson.

person I was dialing, so I could check with the man at the South Pole for confirmation. She told me that it was an unlisted number. I explained the circumstances, that the man was in Antarctica and wanted to call his wife and had no other means of reaching her. She was polite but firm. There was an absolute rule about giving out unlisted numbers.

I said, "I think I have the number right except, perhaps, the last digit." She said, "Why don't you try running it down one digit at a time?" I felt that she was trying to tell me something. I said, "Do you mean getting ten people out of bed at 3:30 a.m.?" Her reply was, "Oh, it won't be that bad. Why don't you try it, starting at the bottom?" I thought it over and decided to go ahead. I called the number again with "1" as the final digit, and made my contact. She came back after the call and I thanked her. She said, "You are very quick." I felt real good about such a nice operator.

Old Friends

My longest patch lasted an hour and a half and was a

series of relays. A man at Byrd station wanted to talk with his fiance in Hawaii. She was to leave there in a week and go to San Francisco to meet him when he came home in a few weeks. She was in a hotel in Maui, and I didn't have much chance of getting a direct patch. I ran down a station in Honolulu, KH6HP, in a downtown office building. He could not hear Byrd station, and Byrd could not hear him, but both stations were copying me fine. However, since I was using a directional array I had problems with both stations copying me simultaneously. When I was talking to Byrd, Honolulu could not hear me, and vice versa. It was a real slow operation. Byrd to me, to Honolulu, to Maui. KH6HP had no patch equipment, so it was all one way at a time. The reply came from Maui to Honolulu, to Ohio, to Byrd station. Norm, KH6HP, had to take notes and then try to get the message straight to me, and then I had to do the same to Byrd. Then the whole thing had to be repeated going west. We got all the information passed and confirmed. When I finally signed with KH6HP and KC4USB, the phone rang. It was the mother of a man who had been stationed at Byrd station a couple of years before, and who had a receiver and a vertical antenna which her son had installed. She was listening, as she often did, to my Antarctic traffic. She said, "Jerry, how I wish I could have had a recorder to record that patch. It was the finest thing I have ever heard." She lives in Decatur, Illinois, and I had patched her son many times when he was stationed at Byrd station. I really appreciated her call.

Madagascar Matchup

One night I was talking with *The American Robin*, a ship in the Pacific. We had been chatting about an hour when I said, "By the way, I would not be surprised if the *Forrestal* should show up one of these nights. She has left her repair location and is on her way home after the big fire." The *Forrestal* was a big aircraft carrier that had been badly damaged by a fire.

The captain of *The American Robin* said "OK, let's drag our feet a minute and see if she's in there." I'll never forget the thrill I got when a voice said, "We're here, all right, this is the *Forrestal* in the Indian Ocean off Madagascar. You have a beautiful signal — how about some traffic? You are the first

stateside station we have heard since we left Singapore." The captain of *The American Robin* said a few words of greeting to him and then dropped out, and I ran patches until the band went dead.

One afternoon I answered a "CQ Stateside" call and picked up a ship off Madagascar, and ran a patch to the captain's wife. When we had finished, a Canal Zone station broke in, a young lady, and asked me if I would pass her greetings to the ship, since she knew the captain, but they could not hear each other. I did so, and he said he wished he could talk with her. I hooked up my tape recorder, recorded her and played it back for him, then reversed the process for a very nice conversation.

Nobody Home

One morning about 12:30 a.m. my phone rang waking me up. When I answered the operator asked, "Are you Jerry?" I said I was. She replied, "I have an emergency call for you." The caller said, "This is Dr. John Katsafrakis at Stanford University. We must get through to Byrd Station, Antarctica. Can you get them for me?" It seems that Dr. Katsafrakis had scheduled a space craft to be launched from Vanderberg Air Force Base in California at midnight EST and had to postpone it because they could not get hold of Byrd. No other station had been scheduled to take readings, and no one had thought to notify Byrd in advance. They rescheduled it for 1:00 a.m. EST. They would have to cancel the launch if contact wasn't made soon since another space craft was scheduled for launch also.

At 1:30 a.m. I called KC4USV at McMurdo station; they had been unable to raise any other Antarctic station all evening. All the time and expense would soon go down the drain if they couldn't get hold of Byrd station within the next few minutes.

I remembered that Ken Nokes, K1TWK, in Ipswich, Massachusetts, had a teletype going into McMurdo which also went into Byrd station. I phoned and got him out of bed, and asked him to get a message to Byrd in a hurry. I gave him the name of the man we wanted. With the phone line open to California, and the receiver set to 7.290 MHz, our regular traffic frequency, at 1:58 am the man John wanted came

through ready to go. They signalled the space craft and the launch took place at 1:00 am on the dot.

After the furor died down, I asked the men on the Ice what the problem was. No one had realized that it was "Mid-Winter's Day" night. This is the greatest celebration in Antarctica. It is the night the sun starts back south, and the mid-point of the long winter night. All stations shut down and the men gather together for a grand and glorious drinking party. They tried to get through to us from Byrd station as soon as they got the teletype, but could not raise us because of weak signals. Three of them ran the 1.3 miles to KC4SUM, Radio Noise Station, which had a better V antenna, and arrived in time for the launch. It was pitch dark and cold, and they had to follow a hand line for safety. They knew nothing of the launch because nobody dreamed that Byrd would not be available.

It was the usual practice for the men at KC4USM, usually only two or three, to go to Byrd station whenever there was any kind of party, to join the thirty or so men at Byrd. It was also common practice to take two or three tubes out of the ham transmitter at each station, so no drunk could get on the air and start running "patches."

Just Footprints

In regard to KC4USM, this is one of the saddest stories concerning them. One night there were two men out there, and they were going in to Byrd station for the night. One of the men left and walked the mile and a quarter to Byrd, expecting the other to follow. It was dark and stormy. The second man, Carl Disch, set out without getting his directions straight. He never arrived at Byrd. When the storm let up they tried to find him but it was hopeless. When the sun came up in the spring every plane coming into Byrd circled the area. They sighted footprints as far away as twenty miles. Although in the Antarctic, snow drifts around even the smallest object, they never found any indication of a man. The belief is that he burrowed into the snow to keep warm, and in doing so sealed his fate. The snow probably blew across him leaving no drift. There have been many efforts to find him with no success. His body will lie there until eternity, or until the Antarctic snow melts, and the snow at

Byrd station is 5000 feet deep.

Pensacola Perch

My most unusual patch happened on November 14, 1965. Eights station had just closed, permanently, and all the men had taken a plane for McMurdo station, about 1600 miles away. From there they would take a plane for New Zealand, and then home. Wanting to see if they had made it I called McMurdo station, and found that they were there. I had worked them every night except three for a whole year, and I wanted to know that they were safe.

Suddenly I heard a "Break." I said, "Go ahead, breaker." "This is KC4USC, are we patch quality?" I told him that he was loud and clear. He wanted a patch to California. I ran the patch, and when he was through I asked him where he was. KC4USC is the aircraft call in Antarctica, and he might be almost anywhere.

"We are on the Pensacola Mountains in two helicopters. When we heard you, we ran a wire between the two 'copters and gave you a call." The Pensacola Mountains are about 350 miles from the South Pole and 12,000 feet high. Nine years later I wrote about the incident in *73 Magazine*. I received a letter from one of the pilots, who by then lived in Virginia. He had forgotten my call and was pleased to hear of me again. He thanked me and said that he had made copies of the articles about phone patching and had sent one to each of the Antarctic stations.

Waikiki, No — McDonald's Yes

On August 8, 1978 I ran a patch for a man at McMurdo station to his wife. He had been ordered to Hawaii, but when he passed the chief's exam, he was promoted and his orders were changed to Okinawa. His wife had already received the "Welcome Aboard" packet, read up on Hawaii, and was really enthusiastic about it.

He had to break the news about Okinawa to her and he was worried about her reaction. Well, it was as bad as he feared. She was speechless, and was crying so hard that we had to terminate the patch. After he was cut off I talked to her, and she said that what she was crying about was not

KC4USV McMurdo Station, Antarctica. A 20 meter beam on a jammed crankup tower that will not raise or lower. U.S. Navy photo by Howard Weinger.

being changed to Okinawa, but the fact that he would be two more months getting home, as he was to go to school in Port Weineme, California. I explained to her that she had misunderstood, and that he would come home for thirty days leave first, and would be home for Christmas and New Year's. She calmed down a little and said that her husband need not call back, she would be OK.

When on September 5, I ran a patch for her again, she was quite used to the idea. I mentioned to her that she actually seemed to like the place she remarked, "Yes, I changed my mind about how primitive it is when I found that they have a McDonald's there."

Nocturnal Challenge

Each amateur operator has his favorite activity. I happen to like phone patching for servicemen, especially for those stationed in places like Antarctica.

For one thing, it is greatly appreciated. When the operator says, "I have a collect call from Bill, will you accept the

charges," and a sleepy wife or loved one says, "I sure will!" I get as much pleasure out of it as she does, and I enjoy hearing her struggle to wake up and her eagerness to talk.

The service people like to talk to their sleepy kids, and once a man just wanted to hear the baby he had never seen cry. The mother had to make the baby cry, and it took a little doing, but she finally succeeded.

These families all sound so normal, and so loving, that it restores your belief in the essential goodness of people. The papers are so full of unpleasant news that it is like a breath of fresh clean air to hear these conversations.

I never run phone patches just to save money. I don't care for any patches where the caller could make a call for a dollar or two, and only wants me to use my time and equipment to save him that so he can talk longer free.

I run traffic for aircraft carriers, mostly, as they have several thousand men from all over the country. Destroyers usually have all their men from their base city, such as Norfolk or Newport or San Diego, and try to get a station in that city.

My favorite is, of course, Antarctica, both because it is needed, and because few stations can handle that distance reliably. It presents a real challenge night after night.

One night I spent three-and-a-half hours running one patch. It was from the "Big I," the aircraft carrier *Independence*, which was in the South Atlantic going around the Cape of Good Hope on its way to Vietnam. A sailor wanted to talk to his wife in Columbus, Ohio, and I didn't get any answer to the phone. It was about 10:00 p.m. and he thought she should be home. I tried every half hour, and finally every twenty minutes. He was half worried and half angry that she was out so late. Finally, at about 1:30 a.m. she answered. He gave her a rather severe few minutes and then calmed down and asked her where she had been.

"I was out with two girlfriends giving our daughter a birthday dinner," she said.

There was a short silence, and the Navy operator running the patch said to me, "Jerry, he will be back in a minute. He just crawled under the rug. He had forgotten his daughter's birthday."

Then came an apology.

Undercover?

From W8PTF.

Listening one evening a few years ago, I heard a station in Taiwan calling "CQ Knoxville, Tennessee" for twenty minutes or more. He was loud, so I finally called him. He said, "Would you please send a post card to Reverend and Mrs. (name withheld) telling them that their son is here? He just got out of China, where he had been held incommunicado for twelve years."

My wife, Polly, said, "Why don't you run a patch and pay for this yourself?" Well, I did, for thirty minutes or more. It was the best few bucks I ever spent in my life.

A couple of years later, at the ham club, an Air Force officer-type walked up to me and said, "Are you W8PTF? That was my station in Taiwan that you handled that patch for, and you'll never know what it meant to that family." I was so flabbergasted that I could only say, "Was he really a missionary, or a spy?"

He said, "Damned if I know."

4

Anecdotes

Nose for Noise

Several years ago I was plagued by a noise that came through my rig at night and ran until morning. I called the power and light company many times during three years, but they would not come over at night, as the men who looked for noises had to come from Dayton, about forty miles away.

After getting nowhere, I finally asked the officer in charge at Antarctica to write the president of the Dayton Power and Light Company. That got quick action.

The heads of four departments invited me to lunch at the Engineers' Club in Dayton, and promised to cooperate. First, I took them to my office in Dayton and showed them my Antarctic slides, so they could get an idea of what the men had to put up with, and why it was important to run phone patches home for them.

They told me to phone the "noise man" at home in Dayton the next time the noise came on. It happened to be the next night. I phoned him at 2:00 a.m. and got him out of bed. He said he would be right over. I said I would wait for him.

He arrived about 3:00 a.m. and said he had located the noise source on the way in. He asked if I wanted to go with him and see how he found it.

I was happy to do so, of course. We went with the receiver set at 14 MHz and there was noise over about a five-

block area. Gradually he went to a higher frequency, and when he got the receiver to 200 MHz, we found that the only place we could hear it was in front of a bedroom window, two blocks from my house. He moved the car, and in about twenty feet lost the noise. He said he would be back later and tell them about it, since he didn't want to awaken them at such an hour.

The man at the noise location said that some people had come to see him about three years ago, but he had no electric blanket, so they left. This time the noise was investigated more thoroughly and it was found that he used a heating pad. He put it at his feet about midnight, and shut it off about 6:00 a.m. — he was rather elderly and his feet got cold. When he heard about all the trouble he had caused, and the DP&L man made him feel that the pad might cause a fire, he got a new one and the noise stopped. The power and light man said he would take the old pad and frame it.

In a sequel to this, some months later his son called me and asked if I could get a message to a small town in Colombia, South America, as his father was dying. I took the message and got on the air. It was about 11:45 a.m. I heard a station signing off on San Andros Island. I knew that the island belonged to Colombia, so I asked the ham to take an emergency message, although he said he was signing off to get back to work. He asked for the message and I gave it as follows: "Father not expected to live. Can you fly home at once?"

He said it would be delivered quickly, although I knew from previous experience that you cannot make a collect phone call in Colombia without going to the telephone company office and leaving a deposit to cover the call, during their office hours. The man who took the message left the air.

About a month later a man came to my door one morning and said he wanted to thank me for sending him the message about his father. His father had died, but he had arrived in time. I asked him when he got the message. He said he got it at 12:15 p.m., less than half an hour after I sent it. He was so interested that he had asked the man who called him about how it got there.

The man who took my message was the owner of a steamship line, and on San Andros Island, in a nearby office

building, was another ham who was the director of all the microwave telephone equipment in Colombia. This man took the message and phoned it direct to the addressee. They were nice to him, and wished him luck on his trip. He was simply astounded.

Incidentally, the radio noise locator who ran down my noise was so interested that he became a ham, and is now a supervisor in Dayton. I have had no problems since, and he was told to check the location about once a month.

The Briny Deep

One night I answered a call from a "Maritime Mobile" who was somewhere in the south Atlantic. We talked for a few minutes, and I asked him what the weather was like.

"Jerry," he said, "I haven't the slightest idea. I am in this floating sewer pipe, and the antenna is sticking out of the water twelve feet, and the rest is submerged." He was in a submarine and sent me a photo of the craft. Later I was to work about thirty submarines over a period of several years, but I haven't heard one since the Vietnam War.

Coffee Break

I have worked riverboats floating down the Mississippi, locomotive engineers crossing the continent, passenger aircraft and bombers flying over the U.S.A., the South China Sea, Guam, Midway, and many other places. The navigators on these flights have little to do between observations, and they love to ragchew with hams.

One day I was driving from Chicago to Washington Court House and I was called by a plane. He was over St. Louis and I was passing South Bend, Indiana. He said he had just worked Iwo Jima off his rear antenna and Germany off his front antenna. He was flying at 30,000 feet. He said he was going into Wright Patterson Field in Dayton, and would be there about 2:00 p.m. He asked me if I went out Route 35 to Washington Court House. I told him I did, but would not be there until about 6:00 p.m. He said, "That's fine. Stop for a cup of coffee. You will pass within two blocks of my house."

I did, and I spent an hour with him and his wife, who is also a ham.

Several days later I received a letter from a ham in Wisconsin. He said, "Jerry, I was listening to you talk to that plane. Did you really stop for coffee? I just had to know." I assured him that I had.

Nice People

Usually, when you meet on the air for the first time, you exchange first names or a nickname, which we call a "handle." I never bother to find out the last names or occupations of most of the people I work. If you find them interesting and compatible, you keep running into them, or meeting on schedule; if you don't you just fade away.

I worked a station in the east for three years before I discovered that its operator was a vice president of NBC News. I talked for about a year to the captain of a half-million dollar yacht, and met him for lunch in Florida once. I used to talk every few mornings with the owner of the yacht, who was president of a large well-known paper company, and we talked while he rode in his Rolls Royce to work in New York. He was having trouble adjusting the antenna on the Rolls. Our common interest was antennas.

Skip Aids Stranded

One night, after midnight, I was ragchewing on the 40m band. I heard a "break, break, break." It was a man on a lonely highway in central California who had burst a radiator hose. He had tried to flag down several motorists, but no one would stop. He was in a panic state. I told him to stand by while I looked around for a Los Angeles station, which I found in five minutes. This station telephoned the state highway patrol, and I went back and told the man in trouble to wait. In less than half an hour a patrol car had found him, and called a garage for him. He had been unable to raise a California station as the skip was over a thousand miles at the time, yet we had no trouble talking between Ohio and California.

Ham Craze

Zerqa, Jordan (UPI). When King Hussein took to the radio waves as Jordan's first ham operator he little realized

that he was starting a craze in his own kingdom. The King began operating as JY1 on a radio set given to him by his English-born wife, Princess Muna. Soon Muna herself joined in as JY2.

Now amateur radio stations have sprouted up all over Jordan and girls are as keen as boys on the hobby.

More than a hundred girls in Zerqa have started tuning in. They are mostly daughters of soldiers living in this garrison town twenty-five miles northeast of Amman. In the boys' school a station is already in operation and teenagers have been making new friends in Europe, the United States and Australia.

The girls get into the act once a week when a class of thirty-one moves to the boys' school to take instructions from Sgt. Mahmoud Hussein of the Royal Jordanian Signals.

A fifteen-year-old class member said, "I want to exchange views with my contemporaries from other countries and give them a true picture of our country in the Middle East."

An older student in the class is a teacher from the girls' school. She said, "This is a new thing in Jordan and I want to be one of the first girls to take it up."

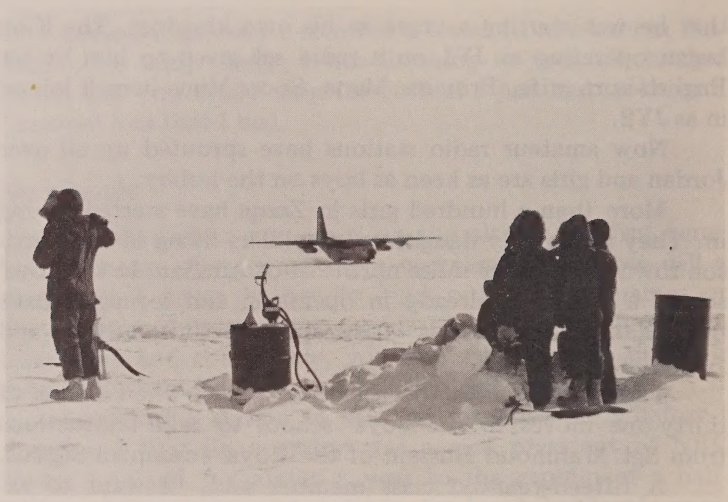
The Jordanian call sign is still rather rare, and as one new ham said, "Sometimes I have six stations coming up on top of each other trying to contact me when I want to close down."

The Army Education Section is sponsoring the new radio stations as a way of getting boys interested in joining the Royal Signals.

Now Hear This

The operator at Eights station in Antarctica was telling me one night about a plane which landed there to bring supplies. The captain came storming into the "under-the-snow" operating room and said, "Why didn't you clear off that runway as you were ordered to do? That was a very rough landing."

The cook-operator replied, "Captain, the runway was perfectly cleared off. That roughness was when you got off the path and were hitting the row of oil drums marking the edge of the runway."



C-130 Hercules refueling at a "pit stop" at Byrd Station, 625 miles from McMurdo Station, on the way to Siple Station. Official U.S. Navy photo by Doug Nortell.

In what the cook said was typical Navy logic, the captain replied, "Well, clear it off again, anyway."

There is a sign often on planes down there which reads, "Antarctica flying consists of hours of sheer boredom interrupted by moments of stark terror."

I used to listen to the air-to-ground frequency at just below 9 MHz, and would hear the planes coming into the various stations. One night I heard a plane say, "We have you on radar, so change over to UHF."

Later I asked a man at Byrd station how they knew it was Byrd on the radar. He replied, "Because there isn't anything else out here."

I remember hearing the pilot report on the way from the States to New Zealand one night, "*Constellation* reporting 900 miles out, no passengers, one crew." He sure sounded lonesome.

Roughing It

Each Antarctic station maintains a supply of food for

five years normal operation, in case war prevents resupply at any time.

The cook at Eights station, when it was being closed in 1965, said the thing he hated most to leave was 500 pounds of frozen Maine lobster.

When the planes came to supply him they would put everything in the plane on rollers, land and taxi in, and then open the back door, give it the gun, and slide the load out on the snow as they took off again.

Since oil freezes at -65°F, a plane cannot let the engines stop or it will be stuck there until spring.

At South Pole station one day a plane captain said the runway need not be cleared, as he could take off across the snow. He did so, but the blocks of snow tore off the antenna, so he had to return for repairs.

Head Start

Mr. Frank A. Gunther, W2ALS, executive vice president of Dynamics Corporation of America, and president of the Radio Engineering Laboratories, was the guest speaker on the twentieth anniversary dinner meeting of QCWA (Quarter Century Wireless Association), held October 27, 1967, in the Gold Room of the Hotel Statler Hilton, New York City.

One-hundred and ninety-three members and their guests attended this affair. Fifty year awards were presented to the eligible members, and charter plaques were presented to the charter members.

Mr. Gunther was well qualified to speak about "The Radio Amateur in National Defense." He stated, "As a devoted ham for over forty-eight years, I still find it exhilarating and stimulating to meet with my amateur friends, not only because I enjoy the good fellowship, but also because I understand their language and they can understand mine. There is no other hobby in the world where the common bond is stronger."

He outlined some of the experiences of communicators in the battle area. He then showed a film of Signal Corps communications in Vietnam. The film focused attention on the execrable conditions to which radio equipment in the field is subjected. He spoke of the failures in such an environment. He continued, "Now who makes these emergency

repairs without benefit of spares or replacement parts? The men on the spot, and I am assured by many officers in the field that, more often than not, the solution is provided by men who have been radio amateurs. Their experience as hams, and their youthful interest in radio communications has provided them a sixth sense which enables them to quickly diagnose the problem and to devise ingenious solutions to place the equipment back on the air in a minimum of time. The radio amateur under these conditions is usually far ahead in technical ability of his buddy who has had only the benefit of training afforded by one of the Armed Forces Radio Schools, and therefore lacks the feel or familiarity which is possessed by the ham operator . . . the term for draftees in the Army is two years and it takes a year to train a man without experience. But not if he is a radio amateur, for a ham quickly becomes familiar with military equipment and its operation.

"Thus, a much longer period of field service is obtained over two years from the draftee radio amateur who has not had to spend so much time in training as his non-ham counterpart."

He continued, "Let's consider another case where the radio amateur has achieved success. Take a situation in which one of our Naval vessels is miles away from any supply base . . . space limitations on shipboard prevent stocking complete parts . . . despite rugged equipment, downtime may occur due to battle damage or other accidents . . . for effective operation radio equipment must be on the air as soon as possible . . . this may require rebuilding . . . utilizing such parts as are available . . . the military readily concur that the finest 'troubleshooters and jury riggers' are generally those officers and men who are radio amateurs.

"This speaks well for the experience, knowledge and enthusiasm acquired by our young people who become amateur operators before they entered the military service. This makes it incumbent upon us to encourage young amateurs to improve their technical capabilities and operational techniques."

Surprise — Surprise

In the summer of 1967 I had a shocking experience. I

was taking down an antenna, and it crossed a 7200 volt line.

I had put up a thirty-two foot vertical antenna made of TV masting, and guyed it with nylon cord. A strong wind came up. I noticed that the tubing was swaying quite a bit, and I feared that it would swing into the 7200 volt line which was about twelve feet away and about twenty feet high.

As I was about to go out and take it down, a friend, Jim Wyatt, WA8NFF, called and I told him what I was about to do. He volunteered to come over and help me.

He held the masting while I cut the cords, and then I grabbed hold of the base and began to slide it down. I was well aware of the power line, but did not realize, and neither did Jim, how much radius of swing was in a thirty-two foot antenna. A gust of wind caught the top, and swung it into the power line.

I felt like a lightbulb. I hurt all over. I had three quick flashes of thought, which I remember very well. First, I thought, "What a stupid way to die." Second, a feeling of sadness came over me as I thought of my wife, and the trouble I was causing her. Third, I thought, "Now, I will find out if it is true that you cannot let go of a live wire."

While I was thinking of this, the mast was falling, and I jerked my hands to drop it. There was a loud report like a gunshot. The mast had hit the top of a strip of hardware cloth which ran along the top of the fence to hold climbing roses. I had recently grounded it because I thought it might be causing receiver noise that had been bothering me. This shorted the mast to ground and blew the fuse in the transformer on a pole about fifty feet away. The report brought out all the neighbors, one of whom was a physician. I asked him if he thought the shock had hurt me any, and he laughed and said, "I guess not." The ground strap had melted, and set the grass on fire. He got some water and put it out.

Later our feet began to itch and we went to the hospital. There they found that there was a row of little holes around the edges of my feet, each large enough to insert a safety match. For months afterwards I had to dig out rotten flesh from them, and inject a salve. My shoes had sewed soles, which was fortunate, because Jim had metal in his shoe and got a bad burn that took months to heal, and even with

his shoes on, it hurt when he walked on gravel.

When it was all over I surveyed the reasons I had survived. The ground was very dry, hard clay. The duration of my fall, until the mast was shorted to ground was less than five seconds, as nearly as I can remember it. The doctor said two things had been safety factors. The high voltage had gripped my heart so firmly that there had been no fibrillation. Also, since I am rather heavy with a waist measurement of about fifty-two inches, the large cross section of my body had supplied a shunt for part of the current around my vital organs. This is one case where obesity did not shorten life. I was sixty-three at the time.

I was very lucky that I had not been wearing gloves, or my hands would have been badly burned. I had a firm grip on the bare metal with both hands.

For one final item I was grateful — Jim Wyatt. He is shorter than I and a little overweight, so his being closer to the hot end of the mast made a fine shunt also.

My wife heard the report and came to the window, but just as she saw me on the ground I started to get up.

While we were standing in the yard talking, a man from the power company arrived, said nothing to anyone, climbed the pole, replaced the fuse and left. I guess he didn't want to get involved.

When people ask about it, I always say, "It was a *very* interesting experience, but I wouldn't want to do it again."

The tip of the masting was burned halfway through and I often look at it to remind me to keep below that 7200 volt line.

The operator at South Pole station said, when I told him, "Jerry, you have now become a charged particle."

5

Looking Forward: The Future of Ham Radio

The original radio amateur was an experimenter. He was isolated in his laboratory, and had no need to work with other amateurs except occasionally to test his own work. This class of amateur still exists, having survived a later development — the communicating amateur.

After the experimenter came the telegrapher. His station became the means of talking with other telegraphers, and of transmitting messages for third parties. It required knowledge of and experience with the Morse code, which is essentially a new language. There is still no real personal contact, since all one would hear is the interrupted tone of the telegraph signal.

Finally, there came radio telephony, and for the first time an operator could hear what his communicator sounded like. He became a real person. Thus the art of ragchewing became more fun. At first glance this would seem likely to completely replace the telegraph communicator.

The fact is that none of these methods replaced the other. Now there is even television, and the telegrapher can use RTTY, and even have his code received on a video terminal so that he does not have to copy the code signals. Each mode still retains its own loyal segment of amateurs.

The main problem now is finding a spectrum space. There is not an unlimited space for everyone, and the telegrapher has the edge here, for he requires the least space. Modern filters have made it possible to operate thousands of

telegraph stations in the existing amateur bands. Not only that, but many operators who achieve their license find that CW is the most fascinating phase of amateur radio. Many novices add an automatic keyer to their equipment at an early stage.

During the Xenia, Ohio tornado aftermath the most useful outlet for messages was found to be a high speed CW link. Thousands of messages are handled each day on the CW sections of the amateur bands. Mistakes are less likely than with phone. The narrow filters keep out much static and other interference.

Gradually the higher frequency bands tend to replace the lower frequencies. With the present rise in the sunspot level, the 10m and 15m bands attract the newcomers. The triband beams appear on most amateur stations early.

There are still oldtimers who stick with the 160m and 80m bands, and most nets are on 75m or 80m, because of the reliability. Yet in daytime these bands are almost unused. Forty meters is still a much-used band in the daytime, but foreign broadcast stations cut much of the usage at night.

The fastest growth is probably the 2m band, and the sophistication of gear for this band is greatest. Digital readout and scanners make 2m equipment among the most advanced.

I expect 220 MHz to be the next big opening for amateur radio. The UHF is gradually replacing the lower frequency bands for short distance communication.

I expect the military establishment to move more and more to satellite operation, releasing lower frequencies. The 1979 WARC has already allocated space near 10, 18 and 24 MHz for eventual use by amateurs.

Last of all, I do not expect vacuum tubes to be completely replaced by solid state equipment. The Navy has told Disaster Services that it is safest to stay with tubes, because, though a nuclear burst would completely knock out solid state equipment, it would have little effect on tubes. Many oldtimers, also, do not care for the new solid state equipment. The vacuum tube equipment is much easier to service and understand for many amateurs.

So much for my look into the crystal ball. Here are a few comments and predictions by Wayne Green, editor and publisher of *73 Magazine*.

Hamming in 1984 and Beyond

There are two ways to project the future . . . one is to look at the progress logged over the last few years and extrapolate a similar speed of change, the other is to look at the ideas which are just now developing and expect them to come to fruit in the near future. It is interesting that most attempts at divining the future have failed rather miserably.

In the amateur radio field we have a number of factors to consider. Equipment has been getting smaller and smaller . . . will this continue until we eventually have the so-called wrist radio? Will we have miniature ham repeaters which can be lofted by balloon, probably on a string?

Satellite hamming has been growing in interest; will the hams of the future all be working each other by means of a small hand transceiver through one or more synchronous satellites?

With the development of the microcomputer the stage is set to go the next step in radio teletype, complete with automatic ham stations which are able to make two-way contacts in a second or less. Will we be having contests where stations are able to work DXCC within an hour?

If we are able to get the FCC to eventually deregulate the rules and permit experimentation with different types of modulation, packet radio, etc., I think we may well develop some techniques within the next five years which will permit much better communications than we have at present on the short wave bands . . . via phone . . . and which will greatly reduce interference. A good system of double sideband is becoming practical, one which would permit perhaps five to ten times the band occupancy of single sideband.

Amateurs are anxious to experiment with time sharing, some teletype techniques which would be wide band, but fast, and many other systems which would involve the magic granted by the use of microprocessors.

Amateur radio teletype got started about thirty years ago with small groups developing the equipment needed using 2m. The long fight against the ARRL to get RTTY permitted on the low bands was eventually won. Within a year there were over two thousand amateurs using RTTY on the low bands. This population stayed relatively constant over the

next twenty-five years, partly due to the shortage of teletype printers and partly due to the lack of commercial equipment to simplify entry into this phase of amateur radio.

The widespread sale of microcomputers in the last year will undoubtedly change this substantially. Roughly twenty percent of the amateurs have gotten involved with computers and have their own microcomputer systems. These can be simply connected for use in place of a teletype machine, so it is logical to expect a sudden increase in RTTY activity based upon the use of these computers. I would predict a growth to perhaps ten thousand active RTTY hams by 1984. These RTTY hams will be using fairly sophisticated techniques of message handling, selective calling, etc.

If we are able to get the FCC to remove the prohibitions from using RTTY in the phone bands we may soon see the marriage of RTTY, slow scan television (SSTV), telephone, calling of wanted hams for contacts, etc., all on published channels.

In the miniaturization end of things . . . we already are able to make ham gear that is so small it is difficult to use and the tendency is to make the size of the box more fitting the size of hands than components. What good is it if you have to use a pin to tune a transceiver? And do we want to have to have a microscope to read out the frequency?

When comparing today's 2 meter rig with its 1968 counterpart, a vast increase in complexity is apparent. Microprocessors, frequency synthesizers, scanning ability, and programmable channels are now standard. This development seems impressive when one realizes that state of the art circa 1968 meant converted surplus taxi and police FM units cast off by municipal governments. Technology marches on!

With roughly half of the active amateurs in the U.S. on 2m FM it is most likely that the pressures of competition for the sale of commercial equipment will force most of the changes into the gear for this band. This has been the case over the last ten years and I think we can look for that to continue.

If problems with unidentified stations bothering repeater groups continues, I am sure we will see the development of very sophisticated homing equipment. This capability may even get built into most of the regular transceivers, since it wouldn't cost a lot extra and would be quite

beneficial.

It may be that there will be more of a desire for amateurs to be able to contact the specific stations they desire . . . this could lead to selective calling circuits built into transceivers . . . even hand units. The more complex units would scan several repeaters, checking for specific calls.

How about ham television? We see more and more ham television repeaters being organized. What does this hold for the future? Little, I think. First, all of the ham repeaters have to be on the same frequency because they are all in one small segment of the 420 MHz ham band and there is not room for two repeaters here. The next band up is 1215 MHz and we don't have much equipment which will work on this band, so it is not a viable alternative.

Even worse, the demands for programming to be of interest on ham TV are not much less than for commercial TV—which means that amateurs quickly get bored with what viewing is available, and interest does not hold up long with complicated mode. This is the same syndrome which has limited interest in SSTV and has kept the number of active SSTV stations low.

That isn't much of a look into the crystal ball, but it's the best I've got right now.

Wayne Green, W2NSD/1
73 Magazine

Excerpts from

The Magic of Ham Radio

by Jerrold Swank/W8HXR

I had just finished running phone patches for the ice breaker Glacier. "Break, break, this is TG9CP in Guatemala. There has been an earthquake . . . thousands are killed. Please notify the Red Cross." Bulldozers sealed over the mass graves filled with victims.

It is the loneliness, the idea that he is cut off from the rest of humanity for a year or more, that gives the arctic explorer his chief worry. It is the long night.

King Hussein was Jordan's first ham operator. He began operating as JY1 on a radio given to him by his wife, Princess Muna. Jordan's second operator was JY2, Princess Muna.

Distances were limited on 200 meters. On February 6, 1917 a message was started on the East Coast, relayed to the West Coast, and an answer received in the record time of one hour and twenty minutes via New York, Jefferson City, Denver and Los Angeles.

We may soon see the marriage of RTTY and Slow-Scan TV.

A man on the ice had received a message from the Navy that his wife was dying. I was on the phone patch for about an hour. The relay came back, "Tell her I love her". I hope I never have to go through what he did. Never.

Cover photo courtesy of Jack Bender/K8TUY